Cost Accounting

CENTRE FOR DISTANCE & ONLINE EDUCATION

Programme: Bachelor of Business Administration

Course: Cost Accounting

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Semester-III

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Syllabus

OBJECTIVE OF THE COURSE:

To develop the skill of decision making to have cost competitiveness and to gain knowledge of recent developments in costing and finally to have a general idea of cost accounting record rules & standards.

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UNIT 2: Strategic Cost Management: Basic Concepts

UNIT 3: Value-Chain Framework, Linkages, and Activities

UNIT 4: Importance of Strategic Cost Management

UNIT 5: Techniques of Strategic Cost Management

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UNIT 12: Standard vs. kaizen costing

UNIT 13: Advantages and disadvantages of Kaizen costing

SUGGESTED READINGS/BOOKS:

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Chapter -1

STRATEGIC TOTAL COST MANAGEMENT

STRUCTURE

1.0 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Strategic Cost Management: Basic Concepts
- Value-Chain Framework, Linkages, and Activities
- Importance of Strategic Cost Management
- Advantages of Strategic Cost Management
- Techniques of Strategic Cost Management

1.1 INTRODUCTION AND MEANING:

Cost management plays an important role in various strategic decision making. Cost information is critical in formulating and choosing strategies as well as in evaluating the continued viability of existing strategic positions. Strategic cost management can be described as scrutinizing every process within your organisation, knocking down departmental barriers, understanding your suppliers' business, and helping improve their processes. Strategic cost management is the use of cost data to develop and identify superior strategies that will produce a sustainable competitive advantage.

DEFINITION:

According to Cooper and Slagmulder:

―Strategic cost management is the application of cost management techniques so that they simultaneously improve the strategic position of a firm and reduce costs.‖

1.2 STRATEGIC COST MANAGEMENT: BASIC CONCEPTS

Decision making that affects the long-term competitive position of a firm must explicitly. The most important strategic elements for a management is and how it can be used to help a firm are its long-term growth and survival.

1. **Strategic decision making**: **strategic decision making** is choosing firm create a competitive among alternative strategies with the goal of selecting a strategy, or strategies for long-term growth and survival.

2. Strategy:- Strategy is a plan of action that will shape the directions of organisation's success in a long run.

3. Strategic Information :- Strategic planning and decision making requires a broad set of information customers, suppliers, different product designs, information about the firm’s environment and internal workings.

4. Strategic Positioning

Uses of cost data to develop and identify superior strategies that will help produce a sustainable competitive advantage. In reality, many firms will choose not just one general strategy, but a combination of the three general strategies. Strategic positioning is the process of selecting the optimal mix of these three general strategic approaches. The mix is selected with the objective of creating a sustainable competitive advantage. The objective of strategic cost management is to reduce costs while simultaneously strengthening the chosen strategic position.

5. Customer Value

The difference between customer realization (what a customer receives) and customer sacrifice (what the customer gives up).

6. Competitive Advantage

Creating better customer value for the same or lower cost than offered by competitors.Various strategies which help in increasing the customer value to achieve a competitive advantage are as

under:

(i)Cost leadership

(ii)Product differentiation

(iii)Focusing

(i) Cost Leadership:- The objective of a cost leadership strategy is to provide the same or better value to customers at a lower cost than offered by competitors. Essentially, if customer value is defined as the difference between realization and sacrifice, a low-cost strategy increases customer . Keep in mind that our definition of product includes services. Services are intangible products. In this case, cost leadership is the goal of the organization. For example, a company might redesign a product so that fewer parts are needed, lowering production costs and the costs of maintaining the product after purchase.

(ii) Differentiation: - Differentiation strategy, on the other hand, strives to increase customer value by increasing what the customer receives (customer realization). A competitive advantage is created by providing something to customers that is not provided by competitors. Therefore, product characteristics must be created that set the product apart from its competitors. This differentiation can occur by adjusting the product so that it is different from the norm or by promoting some of the product's tangible or intangible attributes. Differences can be functional, aesthetic, or stylistic. For example, a retailer of computers might offer on-site repair service, a feature not offered by other rivals in the local market. To be of value, however, customers must see the variations as important. Furthermore, the value added to the customer by differentiation must exceed the firm's costs of providing the differentiation. If customers see the variations as important and if the value added to the customer exceeds the cost of providing the differentiation, then a competitive advantage has been established.

(iii) Focusing:- Focusing strategy is selecting or emphasizing a market or customer segment in which to compete. One possibility is to select the markets and customers that appear attractive and then develop the capabilities to serve these targeted segments. Another possibility is to select specific segments where the firm's core competencies in the segments are superior to those of competitors. A focusing strategy recognizes that not all segments (e.g., customers and geographic regions) are the same. Given the capabilities and potential capabilities of the organization, some segments are more attractive than others.

1.3 Value-Chain Framework, Linkages, and Activities

Industrial value chain linked set of value-creating activities from basic raw materials to the disposal of the finished product by end use customers. Fundamental to a value-chain framework is the recognition that there exist complex linkages and interrelationships among activities both within (internal)and external to the firm. Successful pursuit of a sound strategic position mandates an understanding of the industrial value chain. The industrial value chain is the linked set of value-creating activities from basic raw materials to the disposal of the finished product by end-use customers. Thus, breaking down the value chain into its strategically relevant activities is basic to successful implementation of cost leadership and differentiation strategies. A value-chain framework is a compelling approach to understanding a firm's strategically important activities. Fundamental to a value-chain framework is the recognition that there exist complex linkages and interrelationships among activities both within and beyond the firm. There are two types of linkages: internal linkages and external linkages.

1. Internal linkages are relationships among activities that are performed within a firm's portion of the value chain.
2. External linkages, on the other hand, describe the relationship of a firm's value-chain activities that are performed with its suppliers and customers. External linkages, therefore, are of two types: supplier linkages and customer linkages.

To exploit a firm's internal and external linkages, we must identify the firm's activities and select those that can be used to produce (or sustain) a competitive advantage. This selection process requires knowledge of the cost and value of each activity.

For strategic analysis, Activities are classified as organizational activities and operational activities; the costs of these activities, in turn, are determined by organizational and operational cost drivers.

1. Organizational Activities and Cost Drivers: - Organizational activities are of two types: structural and executional.

a) Structural activities are activities that determine the underlying economic structure of the organization.

b) Executional activities are activities that define the processes and capabilities of an organization

and thus are directly related to the ability of an organization to execute successfully.

Organizational cost drivers are structural and executional factors that determine the long-term cost structure of an organization. Thus, there are two types of organizational drivers: structural cost drivers and executional cost drivers. Possible structural and executional activities with their cost drivers are listed as follows:-

i) Structural Activities & Structural Cost Drivers :-

Building plants, Number of plants, scale, degree of centralization

Management structuring, Management style and philosophy, Grouping employees ,Number and type of work units, Having complexity , Number of product lines, number of unique processes, number of unique parts, degree of complexity, Vertically integrating Scope, buying power, selling power, Selecting and using process technologies , Types of process technologies, experience

ii) Executional Activities & Executional Cost Drivers :-

Using employees, Degree of involvement, Providing quality, Quality management approach, Providing plant layout, Plant layout efficiency, Designing and producing products, Product configuration.

As it shows, it is possible (and perhaps common) that a given organizational activity is driven by more than one driver. For example, the cost of building plants is affected by number of plants, scale, and degree of centralization. Similarly, having complexity may be driven by the number of different products, number of unique processes, and number of unique parts.

Of more recent interest and emphasis are Executional drivers. Considerable managerial effort is being expended to improve how things are done in an organization. Continuous improvement and its many faces (employee empowerment, total quality management, process value analysis, life-cycle assessment, etc.) are what executional efficiency is all about. Consider employee involvement and empowerment. The cost of using employees decreases as the degree of involvement increases. Employee or worker involvement refers to the culture, degree of participation, and commitment to the objective of continuous improvement.

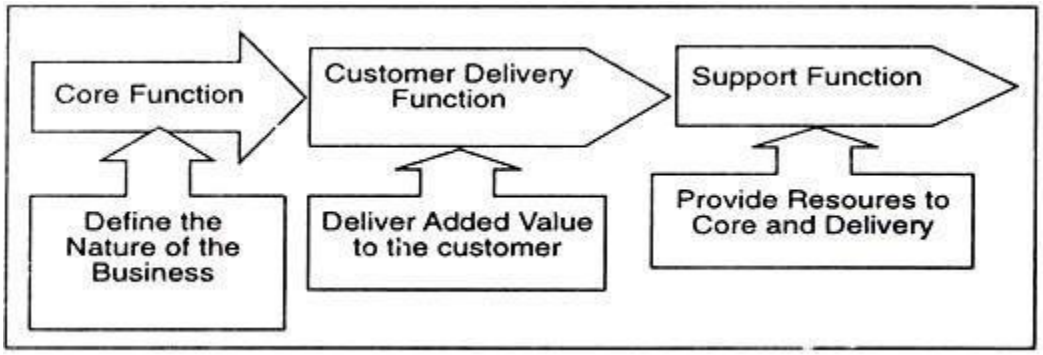
1.Operational Activities and Drivers :- Operational activities are day-to-day activities performed as a result of the structure and processes selected by the organization. Examples include receiving and inspecting incoming parts, moving materials, shipping products, testing new

products, servicing products, and setting up equipment. Operational cost drivers (activity drivers) are those factors that drive the cost of operational activities. They include such factors as number of parts, number of moves, number of products, number of customer orders, and number of returned products. As should be evident, operational activities and drivers are the focus of activity-based costing.

The structural and executional activities define the number and nature of the day-today activities performed within the organization. For example, if an organization decides to produce more than one product at a facility, then this structural choice produces a need for scheduling. Similarly, providing a plant layout defines the nature and extent of the materials handling activity. Although organizational activities define operational activities, analysis of operational activities and drivers can be used to suggest strategic choices of organizational activities and drivers. For example, knowing that the number of moves is a measure of consumption of the materials handling activity by individual products may suggest that resource spending can be reduced if the plant layout is redesigned to reduce the number of moves needed. Operational and organizational activities and their associated drivers are strongly interrelated.

Framework of Strategic Cost Management:-

The Framework of Strategic Cost Management provides a clear plan of attack for addressing costs and decisions that affect them. Following are the three core components of this framework.



Core Functions:

Core functions lay emphasis on the nature of the business. It answers the very obvious question what type of business are we in? At this stage the firm has to clearly identify its courses of actions with respect to strategy planning, research and development, and product development.

Customer Delivery Function:

This step emphasises more on value addition with various activities such as marketing, sales, manufacturing, quality assurance and control, sourcing, procurement, engineering and maintenance, customer service and technical support etc. Excellence in these activities can create a sort of competitive advantage for the firm if it could harness its resources intelligently than its competitors.

Support Functions:

As the name suggests, to support the core activities of business some secondary activities are to be carried out which include IT, Finance and Accounting, HR management, General administration etc.

These activities will facilitate the performance of the core activities in a way that goals of the firm can be accomplished successfully without wasting limited resources. They will also help in synchronizing the different tasks which are to be carried out simultaneously to become cost leader.

1.4 Importance of Strategic Cost Management:

Strategic cost management has become an essential area now a day. It has provided the business with an improved understanding of its sources of profits. While formulating the strategy for the accomplishment of organisational overall objectives, different cost drivers should be clearly identified. Strategic cost management reduce its costs in key areas on which the success of organisation is mainly dependent. Strategic Cost Management provides number of benefits to different organizations. Strategic Cost Management is useful in the following ways:

(i) It has developed a framework for reviewing the strategic allocation of resources across the business based on core business processes and activities.

(ii) It has improved the businesses understanding of its cost drivers leading to improved articulation of its strategic plans in cost terms.

(iii) It has enabled the business to assess, at a high level, how activity-based techniques can be deployed at different levels in the business to improve its cost management process, such as in budgeting and in process improvement.

Main Applications of Strategic Cost Management:

The following are the major applications of Strategic Cost Management:

1. Product Costing:

In many companies, product cost information available is deficient. It is important to capture the activities that are attributable to each product or to more product groups and determine the pricing and other policies of the company that are appropriate. In most of the cases product costs have turned out to be incorrect.

2. Make or Buy Decisions:

Make or buy decisions should be made on strategic considerations. Even so, cost considerations are important. For example, the decision to outsource a component could result in a number of activities causing additional overhead. A sophisticated understanding of costs would enable managers to outsource only parts that are not strategically significant or are easy for outsiders to manufacture.

3. Marketing Channel Decisions:

These decisions could benefit from the SCM approach. The decision to sell to specific customers through specific channels is one possibility.

4. Product Design:

Designers, generally, do not have cost information and, therefore, are likely to come up with designs that may not be cost efficient. A few companies have started forming teams consisting of designers, manufacturing engineers, cost accountants and marketing managers as part of their new product development efforts.

5. Activity Analysis:

It is important to identify activities that add cost but not value to the customers. Such activities are called non-valued activities and must be eliminated from the business to remain competitive. Non-value added activities include inspection, internal movements and waiting for the next operation. These activities result in unnecessary expense and increase manufacturing or service lead time. As a result, a business that has a large number of non-value added activities would be unable to introduce new products rapidly and in time and within acceptable cost limits.

1.5 Techniques of Strategic Cost Management:

The following are the major techniques of Strategic Cost Management:

1. Activity Based Costing (ABC):

ABC is a natural outgrowth of today's competitive and complex environment. ABC provides a closer approximation of the cost of a product than that provided by the traditional volume based costing method. The main principle of ABC states that activities cause costs and to control costs, the activities must be controlled. Under ABC system, the activities are identified, the expenses related to each activity are clubbed together to get activity-wise expenses, a cost driver for each activity is selected and finally the cost of the product is worked out. ABC records the cost of not doing also. The system monitors activities more closely, relates costs to activities and bring in cost effectiveness. This system of costing makes a great impact in the service sector also. ABC is a primary source of information for Activity Based Management (ABM).

2. Target Costing (TC):

As customers become more demanding and seek great value, importance of effective cost management becomes even more. Much of the Indian manufacturing in the past was occurring in a cost plus environment, aided by extensive government regulations. The operating practice was to fix a price as: Price = Cost + Profit. But in the global market the customer will dictate the price and features that he will be looking for. Target costing is a new attempt in which cost is the difference between the price expectation of the customers and margin expectations of the corporation entities. Cost = Price – Target Profit. Management Accountant will have to work closely with design and engineering personnel to achieve this target.

3. Benchmarking:

Benchmarking is the process of determining who is the very best, who sets the standard, and what that standard is. In other words, Benchmarking refers to the search for the best practices that yields the benchmark performance, with emphasis on how you can apply the process to achieve superior results.

Often Benchmarking is used to evaluate performance. Benchmarking represents **"best practice"** available inside or outside the organization.

4. Business Process Reengineering (BPR):

Business Process Reengineering, when fully implemented, will reduce a lot of clerical work and maintenance of records. Thus Purchasing, Material Receipts, Accounts Payable procedures and documentation will be virtually eliminated. Instead annual contracts with a few reliable suppliers to whom payments for quantities consumed in production will be made.

These improvements are made possible by the rapid strides made in Information Technology. Government support and the attitude of Business Executives at the top level will determine the pace of acceptance of these recent developments.

It can be noted that the above system and practices would lead in overall improvement in the performance of the organisation, reduction in cost of production and improvement in productivity. As such the above singularly and collectively play a very vital role in the financial control of an organisation.

5. JIT Inventory Control System:

Originally developed in Japan and successfully implemented. Under this system, a company should maintain a very minimal level of inventory and rely mostly on suppliers to provide parts and components **"Just in Time"** to meet assembly requirements.

JIT philosophy is dedicated to the elimination of waste because stocks of raw materials and finished goods are reduced leading to minimum holding cost of inventory.

However, this system may not be applicable in the present Indian situation because of unreliable transport arrangement, not so excellent relations with suppliers and distance of supply sources from the factory. Over emphasis on safety stock will come in the way of its implementation.

6. Balanced Score Card:

The balanced score card is a strategic cost management technique for communicating and evaluating the achievement of the strategy of the organisation. It has been developed by Kaplan and Norton. This technique has been adopted by rapidly growing organisations as a mechanism to help effectively manage their performance and strategy.

Traditional financial measures such as ROI, RI, value added, EPS, variance analysis etc. deal with past performance and are inadequate for evaluating current information needs of large growing companies.

Traditional performance measures have the following drawbacks:

1. Performance measures lay too much emphasis on financial aspects.
2. Measures are not customer oriented and do not take care of the requirements of customers.
3. Departmental performance measures are not linked to the organisation's strategic objectives and as a result fail to achieve the overall objectives of the organisation.
4. Sometimes performance measures are irrelevant to the situation.

5. Traditional performance measures are mainly developed to meet the requirements of the organisations who are operating in a seller's market. But now a day's business enterprises are operating in a buyer's market where there is acute competition.

For survival in the market, the organisation must come up to the expectations of customers and must deliver defect free product on time at a low price. Organisations must develop performance measures that take care of customers expectations.

Prior to 1980s management accounting, control systems used to focus mainly only on financial performance measures.

Only those items were included which could be expressed in monetary terms and motivated managers to focus excessively on cost reduction and ignore other important variables (such as quality, delivery, after sales service, etc.) which were necessary to compete in the global market that emerged during the 1980s.

Consideration of non-financial measures plays a very important role these days in achieving success of financial terms. Thus, a mix of non-financial measure and financial measures emerged to cope with the requirements of customers. Performance measurement systems much achieve a balance which supports progress against pre-determined objectives.

According to Kaplan and Norton previous system that incorporated non-financial measurements used ad hoc collection of such measures more like checklists of measures for managers to keep track of and improve than a comprehensive system of linked-measurement. The need to integrate financial and non-financial measures of performance led to the emergence of the balanced scorecard (BSC).

Four Perspectives of Balanced Score Card:

The four perspectives of Balanced Score Card as developed by Kaplan and Norton may be described as under:

1. Customer perspective, i.e., how to customers view us. This perspective lays emphasis on the ability of the organisation to provide quality goods and services promising delivery in time and ensuring that goods and services are provided at low cost and low cost of ownership keeping in view the overall satisfaction of customers.

2. Internal business process perspective (i.e. to satisfy our shareholders and customers at what business must we excel?). The organisation should make efforts to excel at the business which will satisfy customers and provide a good return to shareholders.

3. Learning and growth perspective (i.e. can we continue to improve and create values?) In order to meet the new changes in the market and coming up to the exceptions of customers, employees should be willing or asked to take on dramatically new responsibilities and may be ready to acquire new skills, technologies and organisational designs that were not available in the past.

4. Financial perspective (i.e. how do we look to shareholders?). This perspective lays emphasis on profitability and market value of the organisation so that shareholders are duly compensated. The purpose of balanced scorecard is to strike a balance in these four perspectives and to achieve the overall best for the organization.

Balanced Scorecard is a Performance metric used in strategic management to identify and improve various internal functions and their resulting external outcomes. The balanced Scorecard attempts to measure and provide feedback to an organisation in order to assist in implementing strategies and objectives.

It is a set of performance targets and results relating to four dimensions of performance—financial, customer, internal process and innovation. As a structure, balanced scorecard methodology breaks broad goals down successively into vision, strategies, tactical activities, and metrics.

As an example of how the methodology might work, an organisation might include in its mission statement a goal of maintaining employee satisfaction. This would be the organisation's vision. Strategies for achieving that vision might include approaches such as increasing employee-management communication.

Tactical activities undertaken to implement the strategy could include, for example, regularly scheduled meetings with employees. Finally, metrics could include quantifications of employee suggestions or employee surveys. So this technique helps to take proper action to create the desired future results.

7. Kaizen Costing:

Kaizen refers to continual and gradual improvement through small betterment activities, rather than large or radical improvement made through innovation or large investment in technology. It is the process of cost reduction during the manufacturing phase of an existing product. Kaizen costing is most consistent with the saying ―slow and steady wins the race.‖

It is a Japanese term for making improvements to a process through small, incremental amounts rather than through large innovations. It is a planning method used during the manufacturing cycle with an emphasis on reducing variable costs in one period below the costs in a base period.

8. Six Sigma:

Six Sigma originated at Motorola in the early 1980s in response to a CEO-driven challenge to achieve tenfold reduction in product-failure levels in five years. It is a multifaceted approach to process improvement, reduced costs, and increased profits. With a fundamental principle to improve customer satisfaction by reducing defects, its ultimate performance target is virtually defect-free processes and products.

The Six Sigma methodology, consisting of the steps:

1. Identifying the Process
2. Define
3. Measure
4. Analyse
5. Improve
6. Control,‖ is the roadmap to achieving this goal. Within this improvement framework, it is the responsibility of the improvement team to identify the process, the definition of defect, and the corresponding measurements, improvement and control.

The primary objective of Six Sigma is to improve customer satisfaction, and thereby profitability by reducing and eliminating defects. Defects may be related to any aspect of customer satisfaction high product quality, schedule adherence, cost minimisation etc.

9. Life Cycle Costing (LCC):

A life cycle cost analysis calculates the cost of a system or product over its entire life span. This also involves the process of Product Life Cycle Management so that the life cycle profits are maximised.

The analysis of this system includes cost for planning, research & development, production, operation, maintenance, cost of replacement and disposal or salvage. This concept provides important information for pricing and also helps in managing cost incurred throughout lifecycle of a system or product.

Process of LCC:

LCC involves identifying the individual costs relating to the procurement of the product or service. These can be either ―one-off‖ or ―recurring‖ costs.

Examples of one-off costs include:

(i) Procurement;

(ii) Implementation and acceptance;

(iii) Initial training;

(iv) Documentation;

(v) Facilities;

(vi) Transition from incumbent supplier(s);

(vii) Changes to business processes; and

(viii) Withdrawal from service and disposal

Examples of recurring costs include:

(i) Retraining;

(ii) Operating costs;

(iii) Service charges;

(iv) Contract and supplier management costs;

(v) Changing volumes;

(vi) Cost of changes;

(vii) Downtime due non-availability;

(viii) Maintenance and repair; and

(ix) Transportation and handling.

It is important to understand the difference between these cost groupings because one-off costs are sunk costs once the acquisition is made whereas recurring costs are time dependent and continue to be incurred throughout the life of the product or service.

Furthermore, recurring costs can increase with time for example through increased maintenance costs as equipment becomes old. These types of costs incurred will vary according to the goods or services being acquired.

10. Throughput accounting and Theory of Constraints (TOC):

During the 1980s Goldratt and Cox (1984) advocated a new approach to production management called Optimized Production Technology (OPT). OPT is based on the principle that profits are

expanded by increasing the throughput of the plant. The OPT approach determines what prevents throughput being higher by distinguishing between bottleneck and non-bottleneck resources.

A bottleneck might be a machine whose capacity limits the throughput of the whole production process. The aim is to identify bottlenecks and remove them or, if this is not possible, ensure that they are fully utilized at all times. Non-bottleneck resources should be scheduled and operated based on constraints within the system, and should not be used to produce more than the bottlenecks can absorb.

The OPT philosophy therefore, advocates that non-bottleneck resources should not be utilized to 100% of their capacity, since this would merely result in an increase in inventory. Thus, idle time in non-bottleneck is not considered detrimental to the efficiency of the organisation.

If it were utilized, it would result in increased inventory without a corresponding increase in throughput for the plant. The process of maximising profit when faced with bottleneck and non-bottleneck operations is known as theory of constraint (TOC).

The process involves five steps:

(i) Identify the system's bottleneck;

(ii) Decide how to exploit the bottlenecks;

(iii) Subordinate everything else to the decision in step (ii);

(iv) Elevate the system's bottlenecks;

(v) If, in the previous steps a bottleneck has been broken go back to step (i).

11. Activity Based Management (ABM):

The adopters of activity based costing (ABC) used it is produce more accurate product or service costs but it soon became apparent to the users that it could be extended beyond purely product costing to a range of cost management applications.

The term activity based management (ABM) or activity based costing management (ABCM) are used to describe the cost management applications. To complement an ABM system only first three stages of the five stages for designing an activity-based product costing system are required.

These are:

(i) Identifying the major activities that take place in the organisation;

(ii) Assigning costs to cost pools/cost centres for each activity;

(iii) Determining the cost driver for each major activity.

ABM rules business as a set of linked activities that ultimately add value to the customer. It focuses on managing the business on the basis of activities that make up the organisation. ABM is based on the premise that activates consume costs.

Therefore, by managing activities costs will be managed in the long-term. The goal of ABM is to enable customer needs to be satisfied while making fewer demands on organisational resources.

ABC also provides information on the cost of activities why activities are taken and how will they are performed. ABM is much broader concept than ABC. It refers to the management philosophy that focuses on the planning execution and measurement of the activities as the key to competitive advantage.

1.6 Summary: From the above we can conclude that Strategic Cost Management helps to find lower cost solutions but this also requires proper supply chain management. Globalized market place and consumer's increased demands on availability put higher pressure on companies supply chain. If supply chain is efficient, then end consumers will be better served. If supply chain is on top, it not only helps to gain new consumers but also helps to retain old ones.

The major responsibility of purchasing is to ensure that the price paid for an item is fair and reasonable because price has a direct-impact on the end consumer's perception of value provided by the organisation. So evaluation of supplier's cost to provide the product and services is an ongoing challenge within all industries. Price analysis focuses simply on a seller's price perspective, giving less consideration to actual cost of production.

On the other hand cost analysis, lays emphasis on each individual cost element (i.e. material, labour, overhead, other administrative costs and profits) and final cost of product. This analysis determines a fair and reasonable price and develop plan to achieve future cost reduction.

So price and cost management should be considered from total supply chain perspective. Strategic cost management requires that purchasing and logistics system should adopt a series of new initiatives that can deliver results of the bottom line. Strategic cost management approaches require that supply chain team work together to identify process improvement that reduces costs across the supply chain. E.g. team based value engineering efforts, on-site supplier development, cross enterprise cost reduction projects, joint brainstorming efforts on new products, supplier suggestion programmes, and supply chain redesign efforts. Organisations should use various techniques of Strategic Cost Management for reducing and controlling cost in today's competitive world. One of the basic things an organisation relies on for its long-term

sustainability is cost management and giving it a strategic emphasis has led to the evolution of a new stream of management known as strategic cost management which is crucial in modern business environment.

KEYWORDS

1. **Strategic cost management :** Strategic cost management is the use of cost data to develop and identify superior strategies that will produce a sustainable competitive advantage.
2. **Balanced Scorecard:** The balanced score card is a strategic cost management technique for communicating and evaluating the achievement of the strategy of the organisation. It has been adopted by rapidly growing organisations as a mechanism to help effectively manage their performance and strategy.
3. **Activity Based Costing:** A cost accounting system that focuses on the activities performed in manufacturing a specific product. ABC provides a closer approximation of the cost of a product than that provided by the traditional volume based costing method. The main principle of ABC states that activities cause costs and to control costs, the activities must be controlled.
4. **Cost driver** – Any factor or activity that has a direct cause–effect relationship with the resources consumed.
5. **Life Cycle Costing :** A life cycle cost analysis calculates the cost of a system or product over its entire life span. This also involves the process of Product Life Cycle Management so that the life cycle profits are maximised.

1.7 CHECK YOUR PROGRESS-A(SELECT THE CORRECT ANSWER)

1. A competitive advantage has been established when

a. customers see the variation as important and the value added to the customer exceeds thecost of providing differentiation.

b. a high-cost strategy increases customer value by minimizing customer sacrifices.

c. a low-profit item is dropped from the product line.

d. both a and b.

2._____involves choosing among alternative strategies with the goal of selecting a strategy or strategies that provides a company with reasonable assurance of long-term growth and survival.

a. Strategic decision making

b. Strategic cost management

c. Competitive advantage

d. Customer value

3._____is creating better customer value for the same or lower cost than competitors or creating equivalent value for lower cost than offered by competitors.

a. Strategic decision making

b. Strategic cost management

c. Competitive advantage

d. Total product

4. _____is the difference between what a customer receives and what the customer gives up.

a. Strategic decision making

b. Strategic cost management

c. Competitive advantage

d. Customer value

5. The total product is the complete range of_____that a customer receives from a purchased product.

a. tangible benefits

b. intangible benefits

c. activity

d. both a and b

6._____is the use of cost data to develop and identify superior strategies that will produce asustainable competitive advantage.

a. Strategic decision making

b. Strategic cost management

c. Competitive advantage

d. Customer value

CHECK YOUR PROGRESS-B(TRUE/FALSE)

1. Strategic cost management is the identification of strategies to develop a competitive advantage.
2. Strategic decision making is important to achieve good inventory control.
3. The objective of strategic cost management is to reduce costs while strengthening strategic positions.
4. There are two general cost management strategies: cost leadership and focusing.
5. Value-chain analysis is identifying and exploiting internal and external linkages to achieve strong strategic positions.
6. Exploiting internal linkages involves the assessment of management reliability.
7. Exploiting supplier linkages is the exploitation of a firm's internal activities.
8. Exploiting customer linkages is not important since customers do not affect profitability.
9. Strategic cost management emphasizes the importance of an external focus and the need to recognize and exploit internal and external linkages.
10. Life-cycle cost management involves two types of life-cycle viewpoints: the marketing viewpoint and the production viewpoint

ANSWERS TO CHECK YOUR PROGRESS-A

1.a 2.a 3.c 4.d 5.d 6.b

ANSWERS TO CHECK YOUR PROGRESS-B

1 True, 2 False, 3 True, 4 False, 5 True, 6 False, 7 False, 8 False, 9 True, 10 True, 11 True,12 False

1.8 REFERENCES

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2. Pasricha A.S and Vashist A.K. ―Cost Accounting ‖, Unistar Publications .

3. Horngren ,Charles T. and Datar ,Srikant M., ―Cost Accounting: A Managerial Emphasis‖

4. Saxena V.K and Vashist C.D ―Cost Management,‖ Sultan Chand and Sons Publications.

1.9 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Explain in detail the importance of Strategic Cost management.

Q.No.2 Explain in detail the techniques of Strategic Cost management.

Q.No.3 Explain the main applications of Strategic Cost management.

Chapter-2

COST CONTROL , COST REDUCTION & COST BEHAVIOUR

STRUCTURE

2.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Meaning of Cost Control
- Steps in Cost Control Process

- Meaning of Cost Reduction
- Importance of Cost Control and Cost Reduction
- Advantages of Cost Reduction
- Cost reduction plan and programme
- Significance of cost reduction cell
- Scope of cost reduction
- Difference between Cost Control and Cost Reduction
- Role of Management accountants _in cost control and cost reduction
- Meaning of Cost Behavior
- Assumptions of Cost Behavior
- Types of Cost Behavior
- How to determine cost behavior
- Resources, Activities, and Cost behavior

2.2 MEANING OF COST CONTROL

Cost Control is a process of controlling the total cost through competitive analysis. It is a practice in which we have to see that the actual cost must be in accordance with the established norms. It ensures that the cost incurred on a process should not go ahead of the pre-determined cost.

It mainly involves a series of functions, which mainly begins from preparation of the budget in relation to the operation, afterwards evaluating the actual performance, and then to compute the variances between the actual cost & the budgeted cost and further, to find out the reasons for the same, finally to take the necessary actions for correcting discrepancies.

Cost control mainly includes:

(1) Exploratory procedures to identify variance of actual costs from budgeted costs.

(2) Analytical procedures to ascertain the cause(s) of variance.

(3) Corrective procedures to produce rearrangement between actual and budgeted costs.

The various techniques used in cost control are standard costing and budgetary control. It is a permanent process as it helps in analyzing the causes for variances which control wastage of material.

Cost control is not a definite program. Relatively, it is a regular activity to be commonly carried out. Cost must be controlled; otherwise, there will be wastage, misappropriation and stealing. To check such type of wastage and misappropriation of resources is a continuous activity. A firm exercising a better control last year does not mean that it has now been relaxed from the cost control function. Cost control relies a great deal on accounting techniques.

"The regulation by executive action of the cost of operating an undertaking particularly where such action is guided by cost accounting". The terms „regulation" and „executive action" indicate conscious attempt of regulating the cost on the basis of predetermined ideas about what cost should be.

It is only when costs are predetermined i.e. a system of standard costing is in operation, that cost control measures can give their best. Thus, cost control aims at reducing inefficiencies and wastages and setting up predetermined costs and in achieving them.

2.3 STEPS IN COST CONTROL PROCESS

- **Establishing Norms** – To exercise cost control it is essential to establish norms, targets or Parameters which may serve yardstick to achieve the ultimate objective. These Standards, Norms or targets may be set on the basis of Research, Study or Past or Actual.
- **Appraisal**: The Actual Results Are Compared with the Set Norms to ascertain the degree of utilization of men, machine and materials. The deviations are analyzed so as to arrive at the causes which are controllable and Uncontrollable.
- **Corrective Measure** – The Variation are Reviewed and remedial measures or revisions of targets, norms standards etc.as required are taken.

2.4 DEFINITION OF COST REDUCTION

Cost Reduction is a process, which aims at lowering the unit cost of a product manufactured or service rendered without disturbing its quality by using new and improved methods and techniques. It ascertains alternate ways to reduce the cost of a unit. It ensures savings in per unit cost and maximization of profits of the organization.

Cost Reduction aims at cutting off the superfluous expenses which occur during the production, storing, selling and distribution of the product. To identify cost reduction, the following are the major elements:

- Savings in per unit cost.
- No compromise with the quality of the product.
- Savings are non-volatile in nature.

Tools of cost reduction are Quality operation and research, Improvement in product design, Job evaluation & merit rating, variety reduction etc.

It depends very much on individual talent coupled with a complete understanding of the business process from design to delivery. ―It is achieved only through a process of analytical appraisal of all aspects of using resources, carried out on a continuous basis from the movement the product is conceived to the movement customer uses

2.5 IMPORTANCE OF COST CONTROL AND COST REDUCTION

The advantages of exercising cost control and cost reduction programme are listed below:

- Better utilization of resources.
- To prepare for meeting a future competitive position
- Reasonable price for the customers.
- Firm standing in domestic and export markets.
- Improved methods of production and use of latest manufacturing techniques whit have the effect of rising productivity and minimizing cost.

- By a continuous search for improvement creates proper climate for the increase efficiency.
- Improves the image of company for long-term benefits.
- Improve the rate of return on investment.

2.6 ADVANTAGES OF COST REDUCTION

The advantages accruing from cost reduction programmes can be discussed under three heads:

1) In so far as an individual company is concerned, cost reduction results in profit improvement. The more the profits, the more stable the company becomes. It enhances the share value improves investment opportunities and facilitates collection of capital.

2) Society will be benefitted by reduced prices which may be possible by savings from cost reduction programmes. Competitive position will improve and the industry as a whole will strive to improve productivity and pass on the advantage of such programmes to the society. Workers and staff of the industry may also be benefited through increased wages and improved welfare amenities.

3) The country also stands to gain immensely by cost reduction programmes. Industry will be able to maintain the international parity in prices of exportable commodities and consequential increase in export will result in increased foreign exchange savings. Also internal revenue will increase through more tax revenues.

2.7 COST REDUCTION PLAN AND PROGRAMME

In order to derive maximum benefit, an overall companywide cost reduction plan is formulated by establishing an overall objective towards which the detailed administration of the scheme should lead. At the outset it may not be possible for a company to exactly settle the degree of cost reduction to be .achieved. However, it may be possible to set a reasonable target in general terms.

Examples of such targets are an overall rate of saving per annum of expected saving expressed as a percentage of total cost.

Within the framework of the plan a detailed cost reduction programme is prepared in drawing up the detailed programme it will be necessary to proceed as follows:

(i) To discover the sources of high costs or waste

(ii) To develop and apply appropriate remedies: A survey of the whole business should be conducted. This will determine the characteristics of the business and the relative importance of various operating key factors such as labor force, material usage and handling, factory layout, plant and equipment, working conditions etc. The relative costs are also analyzed to re-establish priorities to be included in cost reduction programme. For this purpose it would be desirable to scrutinize cost records of the following kinds:

(a) Trading results by products or product group.
(b) Product cost and main cost element ratios for product groups
(c) Departmental analysis of overheads
(d) Product cost standards and variances.
(e) Budgeted and actual performance.
(f) Labor cost and capacity utilization reports.
(g) Stores consumption analysis.

Such an analysis will reveal whether a particular product cost or the cost of material or labour content of the particular product offers scope for reduction. Accordingly priorities can be established for inclusion in the cost reduction programme depending upon the need for cost reduction and the extent of savings likely to arise.

(iii) Study of procedure: A critical study of the existing procedures, methods of operations processes involved in the manufacture should be made with a view to eliminate unnecessary

operations or simplify and improve them to reduce ultimately the cost of production. Such a study in general seeks to establish:

(a) the need for the task being performed.
(b) The precise nature of the task.
(c) The most efficient method of performing the task.

(iv) Control over the programme: The progress of cost reduction programme should be to close control by a time-table co-coordinating the many varied phases of the overall plan. Control is exercised through regular reports.

2.8 SIGNIFICANCE OF COST REDUCTION CELL

A programme of cost reduction cannot be implemented by a single person. The active participation of management is required. The cost reduction programme needs an efficient cell to achieve results. The formulation of a detailed and coordinated plan of cost reduction demands a systematic approach to the problem and decision to embark on such a programme should therefore be followed by the creation of an organized cell for the purpose.

The scope of cost reduction is so vast that it will often demand the attention of a number of experts from different fields. It is therefore advisable to direct the operations of cost reduction programme through the medium of a broad-based cell. The cell can play a very important role in ensuring that profits are maximized. The principal advantage of this method is that the people wanted all given a definite assignment and positive results may, therefore be expected.

The cost reduction cell should include representatives from all major divisions of the business and may therefore be composed of Production Manager. Work Study Engineer. Sales Executive and Cost Accountant. The Composition of the cell however depends upon the problem to be investigated .If the problem taken up affects many divisions of the business then it is only logical

to have representatives from each division. The members of the cell an often released from their normal duties during the period they are engaged on specific assignment of cost reduction. This type of cost reduction cell proves to be quite effective as it ensures concerted action.

2.9 SCOPE OF COST REDUCTION

Cost reduction is attainable in almost all areas of business activities .there is perhaps no situation which cannot be improved. It covers a wide range like new layout, product design, production methods, materials and machines in factories as well in offices, innovation in marketing etc. It also extends to specified activities like purchasing, handling, packaging, shipping, warehousing, marketing, use of administrative facilities and even utilization of financial resources.

Excessive cost may result in every organization from:

a) Lack of information about raw materials, processes, products etc.
b) Lack of utilization of ideas generated from performance and economic analysis.
c) Honest but wrong beliefs that certain things are impossible for achievement.
d) Temporary circumstances like features developed under pressure or modifications made to meet certain circumstances.
e) Habits and attitudes of confining to one conventional method.

It is not necessary for management to proceed in any specific sequence in considering the various aspects of cost reduction and it may be necessary to start the campaign in more than one direction at the same time.

2.10 KEY DIFFERENCES BETWEEN COST CONTROL AND COST REDUCTION

KEY DIFFERENCES BETWEEN COST CONTROL AND COST REDUCTION		
Meaning	A technique used for maintaining the costs as per the set standards is known as Cost Control	A technique used to economize the unit cost without lowering the quality of the product is known as Cost Reduction.
Savings in	It starts from the established cost	It challenges the standards

	standards and attempts to keep the costs of operations of a process in line with those standards.	forth-with and attempts to reduce cost on a continuous basis.
Retention of Quality	Not Guaranteed	Guaranteed
Nature	Temporary	Permanent
Emphasis on	The main stress is on the past and present behavior of cost.	The main stress is on the present behavior of cost and largely on future cost.
Ends when	The pre-determined target is achieved	No end
Accounting Techniques	Relies on Accounting Techniques	Does not make use of accounting techniques.
Quality maintenance	Does not guarantee quality maintenance	100% quality maintenance
Type of Function	Cost Control is a preventive function. Costs are optimized before they are incurred.	Cost reduction is a corrective function .It operates even when efficient cost control system exists. There is a room for reduction in the achieved costs.

2.11 MANAGEMENT ACCOUNTANTS‟ ROLE

Management accountant role in cost control and cost reduction is perhaps central to his role as a member of the management team. For effective cost control, it may be necessary to spend more on the items which will reduce waste and scrap, improve quality, increase productivity or conserve energy. It is also up to the Management Accountant to channelize the cost control and cost reduction efforts into areas which will give the greater results. It may be instructive to remember that high quality low cost manufacturer like the Japanese car companies are typically very liberal with expenses like company paid holidays and entertainment on business account.

Their control measures are directed towards everyone doing their jobs, work efficiently and productivity, not in pouring down employee fringe benefits. It is important for the management Accountant to guide the company‘s cost control and cost reduction programme into productive lines and not let it degenerate into morale damaging axing of petty expenditure.

2.12 Summary

The two techniques cost control and cost reduction are used by many manufacturing concerns to diminish the cost of production. Cost Reduction has a larger scope than cost control as cost reduction is applicable for all the industries, but cost control is applicable only to the industries where pre- optimization of the cost which is not yet incurred is possible. Cost Control works as a road map for the organization to incur costs as per the set standard. On the other hand, cost reduction challenges the established standards by decreasing the costs and increasing the profit.

Cost behavior is the manner in which expenses are incurred by changing business activity. A business manager must be aware regarding cost behaviors while constructing annual budget, to forecast whether costs will lead or decline. For instance, if the usage of a production line is approaching its maximum capacity, the relevant cost behavior would be to expect a large cost increase (to pay for an equipment expansion) if the incremental demand level increases by a small additional amount.

Mainly cost behavior falls into three categories: -

1. Variable cost, which is directly vary with the changes in the activity. For example, there is a specific direct materials cost associated with each product sold.
2. Fixed costs are that which do not change with the changes in business activity levels. For example, the rent on a building will not change, even if the sales level of the tenant changes dramatically.
3. Mixed costs are that which contain both fixed and variable cost elements. For example, an Internet access fee includes a standard monthly access fee (which is fixed cost) and a broadband usage fee (which is variable cost).

2.13 Meaning of Cost Behaviour

Cost behavior refers to when there is a change in total costs due to a change in some business activity. In order to study the cost behavior, we must understand three types of costs that can change in response to a business activity: fixed, variable, and mixed.

2.14 Assumptions of Cost Behaviour

Following assumptions are to be followed while estimating cost behavior:

- Total Production should be equal to total sale. In other words, there is no change in inventory levels.
- Costs behave in a linear manner.
- The level of activity (sales and production) occurs within the relevant range.

The Relevant Range

The relevant range is that range of activity in which a cost behavior holds true. It is the normal range of production or sales that can be expected for a particular product or company. For example, a particular retail store may have normal monthly revenues ranging from Rs. 1, 50,000 to Rs. 2, 80,000. The costs that are identified as fixed, such as manager salaries, are expected to remain the same throughout the entire relevant range. If sales were to increase to Rs. 3, 50,000, the company would likely acquire additional salaried workers, thereby increasing its fixed costs. Conversely, if sales drop to Rs. 1, 20,000, the company would likely lay off a manager to reduce total fixed costs

Managers expect that within the relevant range, fixed costs will always remain the same in total, and variable costs will increase proportionately as the activity levels increase. Above or below the relevant range, forecasts of cost behavior may not be linear and estimations of future costs may be less accurate.

2.15 Types of Cost Behavior

1. **Variable Cost Behavior**

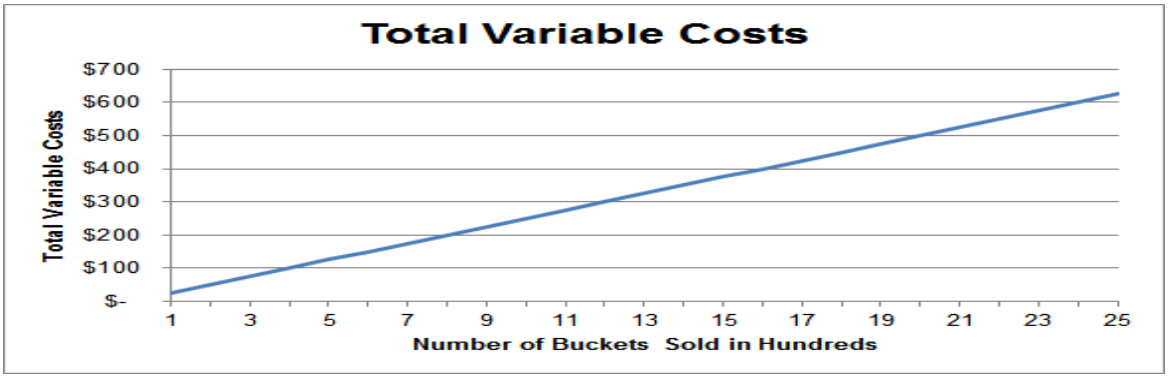
Total variable costs vary in directly with the proportion of the volume. In other words, the large quantity of goods produced and sold, higher the total variable cost. The unit variable cost is the same at every level of activity. Total variable cost is zero if no units are produced and sold.

Assume that Bates, Inc. produces beach buckets at a variable production cost of Rs. 0.25 each. The total variable costs at each level of activity up to 2,500 buckets. The total variable cost rises to Rs. 625 when the number of buckets sold reaches 2,500 (2,500 x Rs. 0.25). The total variable cost when zero buckets are sold is Rs. 0. As the number of units sold increases, the total cost increases. The mathematical function of this line is shown as:

$Y = 0.25\ x$

Where Y is the total cost and x represents the 'activity'.

In this case, the activity is the number of buckets sold.



Some examples of variable costs include:

- Materials and parts to manufacture products
- Hourly employee labor (wages) to produce or assemble products or to provide services to customers
- Some selling expenses, such as commissions and delivery costs of shipping products to customers

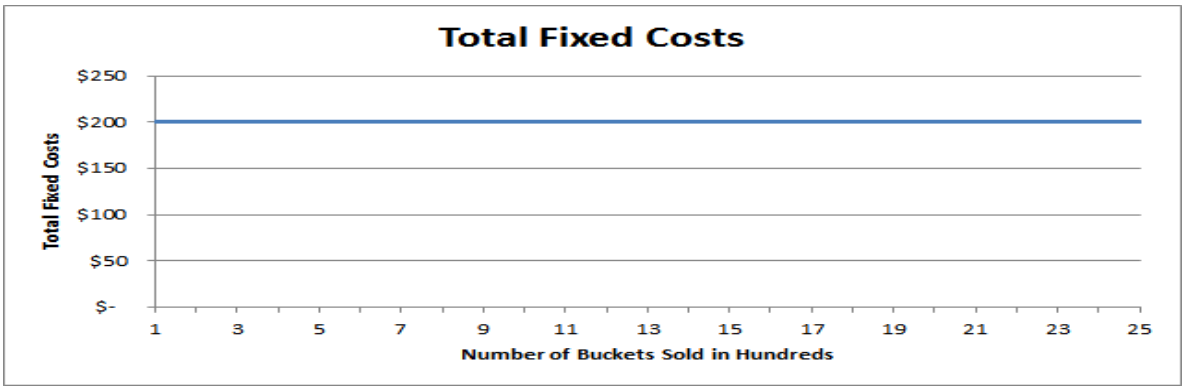
2. Fixed Cost Behavior

Total fixed costs stay the same amount in total as volume changed. In other words, regardless if more or fewer buckets are sold, total fixed costs are the same total cost.

Assume that Bates, Inc. incurs a monthly rental cost on its retail store totaling Rs. 200, regardless of the number of buckets the company produces and sells. The math function for this cost is:

$Y = 200$

Where Y is the total cost. The total monthly rent cost is not dependent upon the number of buckets sold.

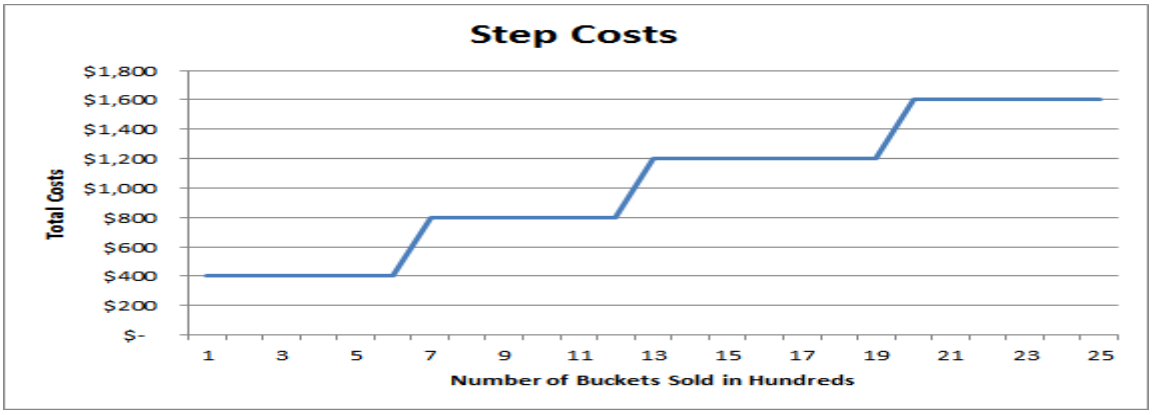


Unit fixed costs vary inversely when more or fewer units are produced and sold. If total production and sales increase, the unit fixed cost decreases. If total production and sales decrease, the unit fixed cost increases. Some example of fixed costs is:

- Rent, Insurance, Salaries for employees, such as supervisors and janitors, Advertising and marketing costs, Depreciation on equipment and buildings

3. Step Cost Behavior

Step costs are costs that are fixed for a short range of activity, then the total cost jumps up to a new fixed cost level for another short range of activity. Step costs look like stair steps when graphed. There are four 'steps' depicting the total costs at each activity 'step' level as shown in diagram. Consider the cost of cashier salaries in Daily's Bucket Store. Each cashier is paid Rs. 400 per week. When sales are less than 600 buckets during a month, the store needs only one cashier, resulting in total cashier salaries of Rs. 400 for the month. When production and sales range from 600 buckets up to 1,200 buckets, two salaried workers are necessary costing Rs. 400 a week, for a total fixed salary cost of Rs. 800. The total fixed cost amount 'steps up' (rises) by the cost of one additional cashier at each range of activity.



4. Mixed Cost Behavior

Mixed costs, often called semi-variable costs, contain both a variable cost component and a fixed cost component. When changes in production/sales occur, mixed costs change in total, but not proportionately to the change in activity,

Mixed costs cannot be accurately predicted because only a portion of the total cost is based on a particular activity. In order to use a mixed cost in forecasting, the amount of fixed and variable costs must be known.

Two common examples of mixed costs are a rental car where a flat daily rate must be paid (a fixed cost) in addition to a cost per mile (variable cost), and a cell phone with a monthly fee plus an additional cost per gigabyte of data when data usage exceeds 5 gigabytes.

Assume that Bates, Inc. incurs a basic monthly cell phone cost for its employees totaling Rs. 450. In addition, the cell phone contract requires an additional Rs. 15 cost for each gigabyte of data used beyond the allotted 4 gigabytes. The math function for data usage cost is:

$$Y = 15.00X + 450$$

Where Y is the total cost and X is the additional gigabytes of data used above 4 gigabytes.

Notice there are two components to the total cell phone cost. The fixed cost portion is Rs. 450, and the variable cost portion is Rs. 15 per gigabyte. Managers must break down all mixed costs into fixed and variable portions. As you will see in the next chapter, there are a number of methods to do this, with some methods more accurate than others.

2.16 How to Objectively Determine Cost Behavior Types

When trying to 'guess' the cost behavior of a particular cost for which you have some insight, think about what happens to the *total* cost when sales and production levels increase proportionately. If an increase in sales/production causes the *total* cost to increase, the cost is considered variable. If an increase in sales/production has no effect on the amount of the total cost, the cost is considered fixed. Think back to the bucket example used earlier. The production and sale of two more buckets causes no change in the total cost incurred for newspaper advertising, nor does it cause depreciation cost to increase. However, producing and selling two more buckets will cause the total production material cost to increase.

A mathematical two-step process is employed to determine the cost type when costs for two or more data periods are known.

Steps 1 - Fixed cost test:

This test involves comparing the total cost at each activity level. If the cost is fixed, the total cost will be the same at all activity levels. If you conclude that the cost is fixed, a second step is not needed and you move on to step 2. For example, assume total costs at 400 units are Rs. 1,200, and total costs at 350 units is Rs. 1,020. Because the total cost differs at the two activity levels, the cost is not fixed.

Step 2 - Variable cost test:

This test involves comparing the unit cost at all activity levels. Calculate the cost per unit by dividing the total cost by the number of units of activity for each activity period. If the cost is variable, the unit cost will be the same at all activity levels. If you conclude that the cost is variable, you can stop testing and conclude the cost is variable. If the unit cost differs at any two of the activity levels, you can conclude the cost is not variable. By default, the cost is mixed. For example, assume total costs at 400 units is Rs.1, 200, and total costs at 350 units is Rs.1, 020. The unit costs are Rs.3.00 (Rs.1, 200/400) and Rs.2.91 (Rs.1,050/350). Because the unit costs differ at the two activity levels, the cost is not variable. By default since the cost is not fixed or variable, it is a mixed cost.

Walk Through Problem

Two costs at Walco appear below for two months of operations. Determine the type of cost behavior for each cost and briefly justify your choice.

Cost	Month	Cost	Units Produced

Copying costs	March	Rs.9,604	9,800
	April	Rs.8,064	8,400
Communications costs	March	Rs.6,080	800
	April	Rs.5,168	680

Solution Copying Costs

Step 1: Perform the fixed cost test by examining the total copying costs for March and April, Rs.9,604 and Rs.8,064. To be considered a fixed cost, the total costs for both activity levels must be the same amount. Since the totals for these two data periods differ at both the 9,800 and 8,400 activity levels, you must conclude that copying costs are not fixed.

Step 2: Perform the variable cost test by calculating and comparing the unit cost at both activity levels.

Unit cost at 9,800 units = Rs. 9,604 / 9,800 = Rs. 0.98 per unit

Unit cost at 8,400 units = Rs. 8,064 / 8,400 = Rs. 0.96 per unit

Because the unit cost differs at the two activity levels, this cost does not meet the definition of a variable cost. Since the cost is neither fixed nor variable, you must conclude that copying costs are mixed.

Hint: The calculation of cost per unit is literal, i.e., the 'cost' is the numerator; per means to divide; and number of 'units' is the denominator.

Communications Costs **Step 1:** Perform the fixed cost test by examining the total communication costs for March and April, Rs. 6,080 and Rs. 5,168. Costs that have the same total regardless of activity are considered fixed costs. Because the total costs differ at both the 800 and 680 activity levels, communication costs are not considered a fixed cost.

Step 2: Perform the variable cost test by calculating the cost per unit at both activity levels.

Unit cost at 800 units = Rs. 6,080 / 800 = Rs. 7.60 per unit

Unit cost at 680 units = Rs. 5,168 / 680 = Rs. 7.60 per unit

Because the unit cost is the same at the two activity levels, communication costs are variable, as they meet the definition of a variable cost.

Mixed Costs:

Mixed costs or semi-variable costs have properties of both fixed and variable costs due to presence of both variable and fixed components in them. An example of mixed cost is telephone expense because it usually consists of a fixed component such as line rent and fixed subscription charges as well as variable cost charged per minute cost. Another example of mixed cost is delivery cost which has a fixed component of depreciation cost of trucks and a variable component of fuel expense.

Since mixed cost figures are not useful in their raw form, therefore they are split into their fixed and variable components by using cost behavior analysis techniques such as High-Low Method, Scatter Diagram Method and Regression Analysis.

METHODS FOR SEPARATING MIXED COSTS INTO FIXED AND VARIABLE COMPONENTS

1. Least Square Method:-

Least squares. $Y = F + VX$ where

Y = Total activity cost (the dependent variable)

F = Fixed cost component (the intercept parameter)

V = Variable cost per unit of activity (the slope parameter)

X = Measure of activity output (the independent variable)

The **dependent variable** is a variable whose value depends on the value of another variable. In the preceding equation, total activity cost is the dependent variable; it is the cost we are trying to predict. The **independent variable** is a variable that measures activity output and explains changes in the activity cost. It is an activity driver. The choice of an independent variable is related to its economic plausibility. That is, the manager will attempt to find an independent variable that causes or is closely associated with the dependent variable. The **intercept parameter** corresponds to fixed activity cost.

Graphically, the intercept parameter is the point at which the mixed cost line intercepts the cost (vertical) axis. The **slope parameter** corresponds to the variable cost per unit of activity.

Graphically, this represents the slope of the mixed cost line. Since the accounting records reveal only *X* and *Y*, those values must be used to estimate the parameters *F* and *V*. With estimates of *F* and *V*, the fixed and variable components can be estimated, and the behavior of the mixed cost can be predicted as activity output changes.

2. The High-Low Method

From basic geometry, we know that two points are needed to determine a straight line. If we know two points on a line, then its equation can be determined. Recall that *F*, the fixed cost component, is the intercept of the total cost line, and *V*, the variable cost per unit, is the slope of the line. Given two points, the slope and the intercept can be determined. The **high-low method** preselects the two points that will be used to compute the parameters *F* and *V*. Specifically, the method uses the high and low points. The *high point* is defined as the point with the *highest activity level*. The *low point* is defined as the point with the *lowest activity level. P*oints in the equation for the straight line, we have: $Y = F + VX$

3. Scatter plot Method

The first step in applying the **scatter plot method** is to plot the data points so that the relationship between materials handling costs and activity output can be seen. This plot is referred to as a **scatter graph**. The vertical axis is total activity cost (materials handling cost), and the horizontal axis is the driver or output measure (number of moves). The relationship between materials handling costs and number of moves is reasonably linear; cost goes up as the number of moves goes up, and vice versa.

The following steps to create a scatter graph and gather costing information from it:

1. Plot a collection of data points on a chart, showing the amount of cost incurred for a given level of activity. The horizontal x axis shows the activity level, while the vertical y axis shows the amount of cost incurred.
2. Plot on the scatter graph a regression line that represents the relationship between the various data points. A typical regression line has a upward slant, indicating that costs increase with unit volume. The regression line may also intercept the y axis above the

zero cost level, indicating the presence of fixed costs that must be incurred even in the absence of any unit activity.

3. Determine from the scatter graph that component of the cost data that indicates the presence of a fixed cost. This is the point at which the regression line intercepts the y axis.

4. After subtracting the impact of fixed costs from the scatter graph, determine the remaining cost per unit of activity, which is the variable cost per unit.

5. Apply these separated fixed and variable costs to the projection of costs to be incurred in the future.

Time Horizon

Determining whether a cost is fixed or variable depends on the time horizon. According to economics, in the **long run**, all costs are variable; in the **short run**, some costs may be fixed. But how long is the short run? Different costs have short runs of different lengths.

Direct materials, for example, are relatively easy to adjust. **Starbucks Coffee** may treat coffee beans (a direct material) as strictly variable, even though for the next few hours the amount already on hand is fixed. The lease of space for its coffee shop in Denver‘s Cherry Creek area, however, is more difficult to adjust; it may run for one or more years.

Thus, this cost is typically seen as fixed. The length of the short-run period depends to some extent on management judgment. However, there are alternative perspectives on the nature of long- and short-run cost behaviors. These perspectives relate to activities and the resources needed to enable an activity to be performed.

2.17 RESOURCES, ACTIVITIES, AND COST BEHAVIOR

Resources are those elements that help one to perform activities. Common resource of a manufacturing plant includes direct materials, direct labor, electricity, equipment, and activities and their relationship to cost behavior and so on. When a company spends money on resources, it is *acquiring* the ability or capacity to perform an activity.

An activity is simply a task, such as setting up equipment, purchasing materials, assembling materials, and packing completed units in boxes. When a firm acquires the resources needed to perform an activity, it is obtaining **activity capacity**. Mostly, we can assume that the amount of activity capacity needed corresponds to the level where the activity is performed efficiently. This efficient level of activity performance is called **practical capacity**.

If all of the activity capacity which is acquired is not used, then we have **unused capacity**. The difference between the acquired capacity and the actual activity output is called unused capacity. The relationship between resource spending and resource usage can be used to define variable and fixed cost behavior.

Resources can be categorized as either (1) flexible or (2) committed.

1. **Flexible resources:-** Flexible resources are supplied only when they used and needed. These are acquired from outside sources, where the terms of acquisition do not require any long-term commitment for any given amount of the resource. Thus, whenever the organization feel the requirement of these then it is free to buy what it needs, when it needs it. As a result, the quantity of the resource supplied equals the quantity demanded. ($Q_s = Q_d$) There is no unused capacity for this category of resources (resource usage = resources supplied). Since the cost of flexible resources equals the cost of resources used, the total cost of the resource increases as demand for the resource increases. Therefore, we generally can treat the cost of flexible resources as a variable cost. For example, in a just-in-time (JIT) manufacturing environment, materials are purchased when needed. Using units produced as the output measure, or driver, it is clear that as the units produced increase, the usage (and cost) of direct materials would increase proportionately. Similarly, power is a flexible resource. Using kilowatt-hours as the activity output measure (activity driver), as the demand for power increases, the cost of power increases.
2. **Committed Resources: -** Committed resources are supplied in advance before their usage. They are acquired by the use of either an explicit or implicit contracts to obtain a given quantity of resource, whether the available resource are fully used or not. Committed resources may exceed the demand for their usage; thus, unused capacity is

possible. Many resources are acquired before the actual demands for the resource are realized.

There are two examples of this category of resource acquisition. First, organizations acquire many multi period service capacities by paying cash up front or by entering into explicit contracts that requires periodic cash payments. Buying or leasing buildings and equipment are examples of this form of advance resource acquisition. The annual expense associated with the multi period category is independent of actual usage of the resource. Often, these expenses are referred to as committed fixed expenses. They essentially correspond to committed resources—costs incurred that provide long-term activity capacity.

A second and more important example concerns organizations that acquire resources in advance through implicit contracts—usually with their employees. These implicit contracts require an ethical focus, since they imply that the organization will maintain employment levels even though there may be temporary downturns in the quantity of activity used. Companies may manage the difficulties associated with maintaining this fixed level of expense by using contingent, or temporary, workers when needed. Many companies have indicated that the key reason for the use of contingent workers is flexibility—in meeting demand fluctuations, in controlling downsizing, and in buffering core workers against job loss.

KEYWORDS

1. **Actual Cost:** Total costs actually incurred and recorded in accomplishing work performed during a given time period for a schedule activity or work breakdown structure component.

2. **Cost Control:** The process of influencing the factors that creates variances, and controlling changes to the project budget.

3. **Cost Driver**: Any factor that causes a change in the cost of an activity or output. For example, the quality of parts received by an activity, or the degree of complexity of tax returns to be reviewed by the IRS.

4. **Cost Object**: An activity, output, or item whose cost is to be measured. In a broad sense, a cost object can be an organizational division, a function, task, product, service, or a customer.

5. **Opportunity Cost** - The value of the alternatives foregone by adopting a particular strategy or employing resources in a specific manner. Also called Alternative Cost or Economic Cost.

6. **Cost Reduction:** It is concerned with cutting off the superfluous expenses which occur during the production, storing, selling and distribution of the product.

2.18 CHECK YOUR PROGRESS-A (Select the Correct Answer)

1. A cost that changes abruptly at intervals of activity because the resources and the costs come in indivisible chunks is called :

a. Step cost
b. Activity cost
c. Allocated cost
d. Apportioned cost

2. The_____portion of a mixed cost varies proportionately with activity within the relevant range.

a. Variable
b. Indivisible
c. Fixed
d. Semi-fixed

3. Managers influence cost behavior through their:

a. Technology decisions
b. Product and service decisions
c. Capacity decisions
d. All of above

4.	In	the	cost	function	equation		Y=F	+	VX,	Y	represents	the:
a.	Total		cost		at	the	X		level		of	activity
b.	Fixed		cost		at	the	Y		level		of	activity
c.	Variable			cost	per		unit		of		activity	X

d. Variable cost at the F level of activity

5 .A is a fixed cost; B is a variable cost. During the current year the level of activity has decreased but is still within the relevant range. We would expect that:

a) The cost per unit of A has remained unchanged.

b) The cost per unit of B has decreased.

c) The cost per unit of A has decreased.

d) The cost per unit of B has remained unchanged.

6. .Salaries of accounts receivable clerks when one clerical worker is needed for every 750 accounts receivable is an example of a:

a) fixed cost

b) step-variable cost

c) mixed cost

d) curvilinear cost

7 .In the standard cost formula Y = a + bX, what does the ―a‖ represent?

a) total cost

b) total fixed cost

c) total variable cost

d) variable cost per unit

CHECK YOUR PROGRESS-B(True or False)

1. Cost control is a preventive function whereas cost reduction is a corrective function.
2. Cost reduction should not be done by arbitrary cost slashing.
3. Cost reduction seeks adherence to standards whereas cost control is a challenge to the standards themselves.

4. Within the relevant range, a change in activity results in a change in total variable cost and the per unit fixed cost.
5. The reluctance of managers to lay off employees when activity declines in the short-run leads to an increase in the ratio of variable to fixed costs
6. A variable cost fluctuates in total as activity changes but remains constant on a per unit basis over the relevant range.
7. A cost that is classified as variable with respect to one measure of activity could be classified as fixed with respect to a different measure of activity.
8. Fixed costs remain constant in total but vary inversely with changes in activity when expressed on a per unit basis.
9. Committed fixed costs have a short-term planning horizon--usually one year.
10. The following costs are all examples of committed fixed costs: depreciation on buildings, advertising, insurance, and management development and training.
11. The time frame in which discretionary fixed costs are controllable is usually much shorter than the time frame for committed fixed costs.
12. The high-low method is generally more accurate than the least-squares regression method in analyzing cost behavior.
13. A major problem with the high-low method of cost estimation is that some data are omitted from the analysis.

ANSWERS TO CHECK YOUR PROGRESS-A 1.a 2.a 3.d 4.a 5.d 6.b 7.b

ANSWERS TO CHECK YOUR PROGRESS-B 1 True, 2 True, 3 False 4 True, 5 False, 6 True, 7 True, 8 True 9 False, 10 False, 11 True, 12 False, 13 True

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2.20 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Explain the nature and scope of cost control and cost reduction? Which of the two is superior?

Q.No.2 What are the various points of distinction between cost control and cost reduction?Also describe the major areas in which Cost reduction is usually possible.

Q.No.3 Explain some of the important tools/techniques of cost control and cost reduction.

Q.No.4 List out the basic steps involved in understanding a system of Cost Control.

Q.No.5 Discuss in detail the behavioral consequences of cost accounting controls

Q.No.6 Explain the meaning of cost behavior along with its assumptions. Also explain various types of cost behavior.

Chapter-3

JUST IN TIME & LEARNING CURVE THEORY

STRUCTURE

3.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- JIT-Background and History
- Meaning of Just in time
- Objectives of JIT
- JIT Manufacturing Principles
- Advantages of JIT
- Disadvantages of JIT
- Meaning of Learning Curves
- Uses of Learning Curve Theory
- Learning curve ratio
- Application of Learning Curve
- Limitations of learning curve theory

3.2 JIT - Background and History

JIT is a Japanese management philosophy which has been useful in practice since the early 1970s in many Japanese manufacturing organisations. It was first developed and perfected within the Toyota manufacturing plants by Taiichi Ohno as a means of meeting consumer demands with least delays. Taiichi Ohno is often referred to as the father of JIT.
Toyota was able to meet the escalating challenges for continued existence through a loom that focused on people, plants and systems. Toyota realised that JIT would only be successful if each individual within the organisation was concerned and dedicated to it, if the plant and processes were arranged for maximum output and competence, and if quality and production programs were planned to meet up demands precisely.

JIT manufacturing has the capability, when properly modified to the organisation, to make stronger the organisation's competitiveness in the marketplace substantially by sinking wastes and convalescing product quality and effectiveness of production.

There are strapping cultural aspects connected with the appearance of JIT in Japan. The Japanese work ethic involves the following concepts.

- Workers are highly motivated to look for constant improvement upon that which previously exists. Although high standards are currently being met, there exist even higher standards to achieve.
- Companies focus on group effort which involves the combining of talents and sharing knowledge, problem-solving skills, ideas and the achievement of a common goal.
- Work itself takes preference over leisure. It is not extraordinary for a Japanese employee to work 14-hour days.

- Employees tend to stay with one company all through the course of their career span. This allows the opportunity for them to sharpen their skills and abilities at a steady rate while offering abundant benefits to the company.

These benefits apparent themselves in employee loyalty, low turnover costs and execution of company goals.

3.3 What is just-in-time (JIT) inventory?

The success of Japanese firms in international market has generated interest among many western companies as to how this success was achieved. It is claimed that the implementation of just-in-time (JIT) production methods has been one of the major factors contributing to this success. The JIT approach involves a continuous commitment to the pursuit of excellence in all phases of manufacturing systems, designs and operations .Just in time refers to a system in which materials arrive exactly as they are needed. Many companies like AT&T. Honda Motors and Siemens, which followed the JIT system started to believe that inventory was a waste that can be minimized through careful planning. The system is so organized that inventory of both raw materials (input) and finished goods is avoided.

Just in time is a management tool that helps to produce the needed quantities, at the needed time. This system is also called as a ―demand pull" system. It advocates in favor of right quantity of goods at right time, the ultimate goal of JIT is to reduce wastages and enhance productivity of the factors of production by taking part in manufacturing process. The main aim of JIT is to eliminate all the activities which do not add value to the product. . The objective of a JIT system is to use to create finished goods is delivered to the production place in time.

The ability to operate with minimum of stocks will, therefore, be dependent on having secure and efficient source of timely material supplies which are of a satisfactory quality and on organizing production resources to ensure that hold-ups and stoppages become negligible and processing lead time is short. If organizing in this way is possible, then JIT philosophy is financially attractive as the benefits of holding stocks are largely lost and following costs and risks, all of which are associated with stock holdings are avoided:

(i) the risk of damaging stocks.

(ii) the risk of stocks becoming obsolete

(iii) the opportunity cost of tying funds up in stocks

(iv) the cost of storing and moving stocks internally; and

(v) the risk of holding losses [where supply prices are falling).

(A just-in-time system is actually a collection of ideas. that streamline a company_s production activities to such an extent that waste of all kinds (time. material and labor) is systematically driven out of the process. When completely implemented and used properly. JIT has a decision, positive impact on production costs.

3.4 Objectives of Just-In-Time (JIT) Method:

JIT aims to achieve the following objectives:

i. Zero Inventory
ii. Zero Breakdowns
iii. 100% on time delivery service
iv. Elimination of non-value added activities
v. Zero defects

3.5 <u>Characteristics of JIT</u>

The consequent savings are to be utilized for reducing cost and rendering better service to the customer. Shigeo Shingo an authority on JIT at Toyota classifies the wastes to be eliminated as follows.

The seven wastes to be eliminated according to JIT are:

- Over production
- Inventory
- Waiting time

- Movement
- Effort
- Defective products
- Over processing

1. ***Over production*****:** Over production is to manufacture products before it is actually needed. If the demand for that product decreases, the extra parts or products produced may not be useful or needed. Also over production results in high storage costs and is also difficult to detect defects. So, over production is considered a waste.

2. ***Inventory:*** Excess procurement or production builds up stock of materials which are not immediately used, thus locking space and funds carrying heavy costs.

3. ***Waiting time:*** Waste of time happen when goods are not moving or being processed. The operator, the machine or the part will either be not working or be worked upon. The duration of waiting is can be said to be unproductive and may create more serious consequences.

4. ***Movement:*** Any unnecessary movement is a waste of energy; it causes blockages, disrupting movements and delaying the flow of other items creating delays.

5. ***Effort:*** The people, who work, do not make a study as to how the products on which they are making are utilized and do not realize the purpose for which they are made. This lack of education will lead to waste of resources. Finally, they end up in shortage of resources when needed.

6. ***Defective products:*** The defective products lead to a tremendous loss to the company. This is because they use up the same equipments, workmen and the time that would be used to make good products. Thus defective products use up resources and result in losses.

7. ***Over Processing:*** Some steps like unnecessary processing or production do not add value to the final output. As a result, it is waste of all the inputs that go into the process.

The JIT philosophy or system seeks to achieve the following goals:

1. Elimination of non-value added activities

JIT manufacturing is best describes as a philosophy of management, dedicated to the elimination of waste. Waste is defined as anything that does not add value to the product. Identification and elimination of non-value added activities (NVA activities) emerged as an important additional benefit of JIT system NVA activities do not improve the quality or

function of a product or service, but they can adversely affect cost and price. The identification of NVA activities stimulates efforts to eliminate or reduce NVA activities. Berliner and Brinson made a study in 1988, based on which process time is less than 10% to total manufacturing lead time in many organizations in USA. Therefore, costs are significantly reduced by adopting JIT system. Under JIT system endeavor is made to convert raw material to finished products with lead time equal to processing time. This practically means effort to eliminate all non-value-added activities.

Moving materials to machine shops and machine set-up for production are examples of NVA activities. Re-ordering parts, expediting production and rework due to defective parts are examples of non-value added activities. Other examples include warranty work, handling customer complaints and reporting defects. Non-value added activities can exist anywhere in the organization. In manufacturing operations. Five major activities are often cited as wasteful and unnecessary:

a) **Scheduling :** An activity that uses time and resources to determine when different products are access to process (or when and how many set-ups must be done) and how much Will be produced.

b) **Moving:** An activity that uses time and resources to move raw materials. Work-in-process and finished goods from one department to another.

c) **Waiting.** An activity in which raw materials or work-in-process use time and resources by waiting on the next process.

(d) **Inspecting**. An activity in which time and resource are spent ensuring that the product meets specifications. .

e) **Storing**. An activity that uses time and resource while a good material is being stacked. None of these activities add value for the customer. Scheduling for example is not necessary, if company has learnt how to produce on demand. Similarly inspection will not be necessary. If the product is produced correctly the first time and thus it adds no value for the customer. The challenge is to find ways to produce the goods without any of these activities.

2 Zero defects

Costs of conformance or compliance are incurred with the intention of eliminating the costs of failure. They are discretionary in the sense that they do not have to be incurred whereas costs of non-conformance are the result of production imperfections and can only be reduced by increasing conformance expenditure. The optimal investment in conformance costs is when total costs of quality reach a minimum. This can occur when 100 per cent quality conformance has not been achieved. It is virtually impossible to measure accurately all quality costs and determine the optimal investment in conformance costs. Some people argue that zero defect policy is optimal. With a zero defect policy the focus is on continuous improvement. With the ultimate aim of achieving zero defects and eliminating all internal and external failure costs.

3 Introducing cellular manufacturing

The ideal layout of each flow line is normally U-shaped. **Cellular manufacturing** is a process of manufacturing which is a subsection of just-in-time manufacturing and lean manufacturing encompassing group technology. The goal of cellular manufacturing is to move as quickly as possible, make a wide variety of similar products, while making as little waste as possible. Cellular manufacturing involves the use of multiple "cells" in an assembly line fashion. Each of these cells is composed of one or multiple different machines which accomplish a certain task. The product moves from one cell to the next, each station completing part of the manufacturing process. Often the cells are arranged in a "U-shape" design because this allows for the overseer to move less and have the ability to more readily watch over the entire process. One of the biggest advantages of cellular manufacturing is the amount of flexibility that it has. Since most of the machines are automatic, simple changes can be made very rapidly. This allows for a variety of scaling for a product, minor changes to the overall design, and in extreme cases, entirely changing the overall design. These changes, although tedious, can be accomplished extremely quickly and precisely

4 Introducing pull manufacturing system in contrast to push manufacturing

Kanban is a Japanese term: _kan‘ means _visual‘ and _ban‘ means card, so roughly translated, it means _card you can see.‘ Taiichi Ohno, father of the Toyota Production System (TPS), originated the term and the Kanban card system in the 1950s to manage the flow of parts in just-in-time (JIT) production lines.

Still in use today, the inspiration for Kanban first struck at a Piggly Wiggly grocery store in the U.S. when Ohno noticed store shelves were only stocked with enough products to meet buyer demand. Inventory would only be replenished when there was an empty spot on the shelf. This gave rise to his idea of providing visual markers—the Kanban card— to reduce unnecessary inventory and a way to uncover workflow and process problems

5 Just in time purchasing

Whenever there is a need of raw material we should purchase at that time instead of making excessive investment in stocks.

6 Shortening or removing set-up time

Reduce or eliminate setup times: aim for single digit setup times (less than 10 minutes) or "one-touch" setup -- this can be done through better planning, process redesign, and product redesign.

Under the JIT concept, inventory may be condensed by the following means:

1. **Decrease production runs**. Fast product setup time save cost-effective to build very short production runs, which ultimately reduces the investment in finished goods stock.
2. **Production departments**. Employees walk individual parts through the processing steps in a work departments reducing scrap part. Doing so also eliminates the work-in-process that typically build up in front of a more specialized work station
3. **Co pressed operations**. Production departments are arranged close together, so there is less work-in-process in stock being change between departments.

4. **Send bulk quantities**. Send are made with the short possible quantities, more than once a day, which nearly eliminates raw material inventories.

Ten Steps to Lean/JIT Production

Steve L. Hunter lists ten steps to implement a Lean/JIT production system:

1. Reengineer the manufacturing system
2. Reduce setup
3. Integrate quality control
4. Integrate preventive maintenance
5. Level and balance the system
6. Integrate a pull system
7. Control inventory
8. Implement a vendor program
9. Utilize computer integrated manufacturing (CIM) benefits

3.6 Advantages of JIT Inventory

Benefits of JIT

While not every company can achieve results at this level, JIT does provide a wide range of

Benefits, including:

1. Reduced inventory

2. Improved quality

3. Lower costs

4. Reduced space requirements

5. Shorter lead time

6. Increased productivity

7. Greater flexibility and innovativeness

8. Better relations with suppliers

9. Simplified scheduling and control activities

10. Increased capacity

11. Better use of human resources

12. More product variety

3.7 Disadvantages of JIT Inventory

There is one key problem with JIT inventory, but it is a large one:

- *Shortages*. Low JIT inventory levels make it more likely that any problem in the supplier pipeline will lead to a shortage that will stop production. This risk can be mitigated through the use of expensive overnight delivery services when shortages occur.

Front-line employees play a significant role in flourishing JIT practice. They work in partnership with management and each other in the continuous pursuit of brilliance. There are several ways in which front-line employees put in to make JIT a success:

- Employees work together to solve the problems and gather data and build consensus on how to improve work processes.

- Employees are accountable for considerate the quality measures of their work and what they have to do to meet the needs of internal and external customers.

- Each employee is empowered to take action to correct problems.

- Employees have cross-functional skill sets that allow them to be assigned to areas which call for help, and to help them accept a broader ("big picture") vision of the production process.

- Unlike conventional "push" surroundings where line workers are moderately independent of one another in their work activities, JIT employees are connected by the "demand pull" discipline, where work is not produced unless the downstream work center needs it. Demand-pull promotes the inter-connectedness of workers.

- Front-line employees are answerable for the main maintenance of their machines. This helps employees have an enhanced understanding of the situation of their equipment and its capacity to meet quality and production requirements.

- Management works with employees by being coaches and facilitators rather than convincing supervisors. Managers are charged with hiring employees who can work in practical team surroundings, and provide the training and incentives to build a work culture that is focused on nonstop improvement.

3.8 Summary: The evolution of JIT into "lean operations"

The JIT philosophy has evolved from a manufacturing-focused management approach to a set of management principles that can be applied to any organization. "Lean operations" is a term that is replacing JIT, especially in service environments. "Lean operations" captures the true essence and power of how a culture built around continuous improvement and the pursuit of value-added activities leads directly to competitive advantage in the marketplace. Lean operations is a management principles for any organization to get higher quality, improved productivity, enhanced deliverance speed, better receptiveness to varying markets, and improved customer satisfaction.

3.9 LEARNING CURVE

The learning curve concept was produced by German psychologist Hermann Ebbinghaus in 1885 and introduced in his book *Über das Gedächtnis* (About Memory). The first known use

of the English phrase ―learning curve‖ is in Edgar James Swift‘s ―Studies in the Psychology and Physiology of Learning.

A learning curve is the depiction in graph appearance of the rate of learning something over time or recurring experiences. Learning curves are an image of the difficulty estimated in learning a subject over a period of time as well as relative progress throughout the process of learning. The learning curve provides a way to demonstrate a subject‘s learn capability.

Learning curves are used by psychologists, students, teachers, employees and employers to plot development and set potential on how much time, training and study might be required to attain competent knowledge of a subject. In IT, learning curves are considered in user interface and product design.

3.10 In any environment if a person is assigned to do the same task, then after a period of time, there is perfection in his routine. If data points are collected over a period of time, the curve constructed on the graph will show a diminish in effort per unit for recurring operations. This curve is very essential in cost analysis, cost estimation and efficiency studies. This curve is called the learning curve. **The learning curve shows that if a task is performed over and over than less time will be required at each iteration**. In history, it has been reported that whenever there has been instanced of double production, the required labor time has decreased by 10 or 15 percent or more.

3.11 Learning curves are also known as experience curve, cost curves, efficiency curves and productivity curves. These curves help show the cost per unit of output decreases over time with the raise in experience of the labor force. Learning curves and experience curves is broadly used by organization in production planning, cost forecasting and locating delivery schedules.

For example, assuming a cost reduction rate of 20%, which equivalent to an 80% (i.e. 100 – percentage of reduction) learning rate, and 8 hours as the time taken for the first unit, the average time per unit for 2 units will be (0.8) x 8 = 6.40 hours, i.e. a total of 12.80 hours for both. Thus the second unit takes 4.80 (12.80 – 8) hours to produce and the incremental cost improvement is 4.80/8 – 60%. Similarly the average for 4 units will be (.8) x 6.40 = 5.12 hours each or a total of 20.48 hours. Thus the third and fourth units will take together, 20.48 – 12.80 – 7.68 hours, and so on for 8, 16, 32, etc. units, as will be seen in the table given below:

Batch No	**Cumulative Production (units)**	**Average cum. hrs required per unit (80% Learning Rate**	**Cum. Total Hrs. to perform task**
1	1	8.00	8.00
2	2	6.40	12.80
3	4	5.12	20.48
4	8	4.10	32.80
5	16	3.28	52.48
6	32	2.62	83.84
7	64	2.10	134.40

Expressed mathematically, the formula for learning curve effect is,

$Y = aX^b = \log Y = \log a + b \log X$

Where,

Y = average number of labour hours required for X units,

a = number of labour hours required for the first units,

X = cumulative number of units produced, and

b = LEARNING INDEX or learning curve constant. This is equal to log 1/log 2, where 1 is the

learning rate. (For Learning rate of 80%, b = log 0.8/log 2 – (-) 0.3219.

If data are available, the formula stated above may be used to determine the learning rate or given the learning rate and other data required to fit with the formula, values of the variables, Y, X, or a, may be calculated. For example, if a pair of the values of Y and X is given, the number of hours required for the first unit (or batch) and the learning rate can be determined. Assuming the values of Y and X for batches 4 and 5 in the table, we have:

$\log 4.10 = \log a + b \log 8$ .. (i)

$\log 3.28 = \log a + b \log 16$ .. (ii)

Solving equations, (i) and (ii) for log a and b, we get:

Log a = 0.9035, or a – 8.00 (This agrees with the figure in table), and

B – (-) 0.3219, or Learning rate – 0.8

To take another illustration: given the learning rate and the number of hours per unit for the first batch, the average cumulative hours required per unit for a subsequent batch, (say, batch 6), may be calculated as follows :-

Y = aXb = 8 x 32 = 0.3219

or log Y = log 8 + (-.3219) log 32

or Y – 2.62 hours

The process of learning cannot go on indefinitely but has to end when a certain efficiency level is reached at a given production volume. In practice, to begin within the first stage, there is a progressive increase in production rate till the maximum expected rate is reached. In the second stage, the maximum rate is maintained and in the third stage, which may be called the reverse learning, the production rate starts falling.

Learning Curve on Graph

Learning curve demonstrates that over a period time, there is an enhancement in productivity but with decreasing rate as production increases. Therefore, if the rate of reduction is 20% than the learning curve is referred as 80% learning curve.

Learning curve is significant in taking following decision:

- Pricing decision based on judgment of future costs.
- Personnel schedule based on future necessities.
- Capital requisite projections
- Set-up of incentive constitution

3.12 Application of Learning Curve – Learning curve may be applied to direct labor, materials and

Spoilage and defective work.

(i) **Direct Labor**: Director Labour is the general appliance area of the learning curve since it is only people who are able of learning. Learning pre supposes a assured degrees of inexperience in the performance of an activity and as such, the learning curve is mainly relevant to new activities and new labour force, whether employed on new or old activities.

(ii) **Materials** – Materials act in response to learning only in an indirect way under specific circumstances. The learning curve is applicable mainly to sub-contract or fabrication order placed outside or apparatus purchased from suppliers. The cost of the sub-contract or the components purchased would usually contain an element of labour and the buyer will anticipate that at least a part of the advantage of learning should be passed on to him in the form of compact price for the repeat orders for the sub-contract or components.

(iii) **Spoilage and defective work**: This is also an part for learning because with the achievement of more skill and efficiency, losses on account of spoilage and defective production would decline.

On0 the other hand, the concept of learning curve may not be profitably applicable in the following cases:-

(i) Where machine work predominates and the process time is limited by the speed and feed of the machine.

(ii) In old well-known industries where no significant change takes place.

(iii) In industries which do not received repeat orders.

(iv) In small units where the magnitude of production is small and costs are low.

Uses of Learning Curve Theory

Learning curve theory can be used:

i. To calculate the marginal cost of making extra units of a product.
ii. To quote selling prices for a contract, where prices are calculated at cost plus a percentage mark up for profit.
iii. To prepare realistic budget.
iv. To compare budgeted and actual costs and report cost variances.
v. When a company companies in a competitive industry, where the contracts are won by the companies who quote the best prices and yet where quoted prices must be high enough to give the contractor a reasonable profit, an awareness of learning curve can

make all the difference between winning a contract or losing it or between making profits and selling it at a loss-making price**.**

The Learning Curve ratio

In the beginning stages of a new product or a new process, the learning effect pattern is so regular that the rate of decline established at the outset can be used to predict labour cost well in advance .The effect of experience on cost is summarized in the learning ratio or improvement ratio.

Learning curve ratio= average labour cost of first 2 units/ average labour cost of first N units

If the average labour cost for the first 500 units of a product is Rs 25 and the average labour cost of first 1000 units is Rs 20,the learning curve ratio will be as follows:

Learning curve ratio=(20/25)*100=80%

3.13 Limitations of learning curve theory

Learning curve suffers from various limitations

1. One short coming of this theory is that it assumes that working conditions are stable. In daily life, it is not practically applicable due to labour turnover.
2. It is not always possible to get enough data which is accurate to decide what learning curve is.
3. Learning curve is not always present. Before it is assumed there should be proof that this assumption will hold good in estimating production times and costs for new items of production.
4. Time break between repeating production should not be too long or the workers will forget and learning process will have to begin all over again.
5. This theory provides that constant stage follows the learning stage. At what point of time constant stage begins it is not easy to ascertain the same.

GLOSSARY TERMS

1. **Pull**: It is a system used by JIT, where operations are triggered by customer demand and materials are pulled through the supply chain

2. **JIT(Just in Time): It is** an approach that organizes operations to occur at exactly the time they are needed
3. **Lead time**: It is the total time between ordering materials and having them delivered and available for use .
4. **Lean strategy** : It is a business strategy that aims at doing every operation using the least possible resource – people, space, stock, equipment, time, etc.
5. **Learning Curve:** A learning curve is the representation in graph form of the rate of learning something over time or repeated experiences.

3.14 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1. In a JIT production system, a production process is sanctioned

a. when an authorization is obtained from a downstream operation.
b. when the production worker is at the work station.
c. when an authorization is obtained from an upstream operation.
d. when the team leader is ready.

2. Which of the following is slightest likely to be part of a switch from a conventional manufacturing system to a cellular manufacturing system?

a. Dedicating the production line to one or a few similar products.
b. Decentralization of support services and operating equipment.
c. Retraining production workers to perform multiple tasks.
d. Increasing the number of cost allocations.

3. A JIT production system would not include an emphasis on

a. The quantity of individual output.
b. Producing products as needed by the next stage.
c. Decentralization of support services.
d. a and b.

4. Which of the following is not considered to be a tool useful in supporting continuous improvement by advocates of JIT?

a. Pareto diagrams.
b. Statistical control charts.
c. Plan-do-check-action cycles
d. accounting variance analysis.

5. Which of the following represent characteristics of a JIT accounting system?

a. Batching vendor deliveries before recording in the accounting records.
b. Increasing the traceability of costs with fewer cost pools.
c. Using backflush cost systems.
d. all the above.

6. Which of the actions stated below is not consistent with JIT purchasing?

a. Reduced inspection of incoming materials.
b. More frequent deliveries from vendors.
c. Long term agreements with vendors.
d. Increased number of vendors to obtain competitive prices.

7. A JIT production system would probably include an emphasis on

a. Maximizing the quantity of output at each operation.
b. decentralizing support services.
c. production authorizations that pull products through the factory.
d. b and c.

8. Which of the following represent manual systems designed to support continuous flow manufacturing?

a. JIT‘s Kanban system.
b. TOC‘s OPT system.
c. An ABC system.
d. d. a and b.

9. The language of JIT includes many terms. Which two of the following terms refer to finding and correcting defects as they occur?

a. kaizen and jidoka.

b. autonomation and kanban.

c. kaizen and kanban.

d. jidoka and autonomation.

10. Which of the following is not a tool applicable to just-in-time?

a. Pareto diagrams.

b. Overhead variances.

c. Control charts.

d. Fishbone diagrams.

11. An assumption of learning curve theory is which of the following?

a) Unit time will decrease at a decreasing rate
b) Unit time will increase at a decreasing rate
c) Unit time will decrease at a increasing rate
d) Unit time will increase at a increasing rate

12. An assumption of learning curve theory is which of the following?

a) The reduction in unit time will follow a predictable pattern
b) Unit time will decrease at an increasing rate
c) The time required to do a task will vary randomly each time the task is repeated
d) Learning will not be transferred from one worker to the next

CHECK YOUR PROGRESS-B(True or False):

1. JIT does not believe in over production.
2. JIT aimed at zero inventories.
3. JIT is a big lot size production.
4. POK stands for Production Ordering Kanban.
5. JIT was successfully implemented by Toyota.
6. Learning curve theory is concerned with the idea that when a new job, process or activity commences for the first time, it is likely that the workforce involved will achieve maximum efficiency immediately.
7. A learning curve usually follows a positively exponential distribution.
8. Another name of learning curve is experience curve.
9. Just-in-time techniques are applicable to purchasing, production and distribution.
10. Logarithms computational methods is used to calculate learning curve statistics.

ANSWERS TO CHECK YOUR PROGRESS-A
1.a 2.d 3.a 4.d 5.d 6.d 7.d 8.a 9.a 10.b 11.a 12.a

ANSWERS TO CHECK YOUR PROGRESS-B

1 True, 2 True, 3 False, 4 True, 5 True 6.False 7.False 8.True 9.True 10.True

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2. Pasricha A.S and Vashist A.K. ―Cost Accounting ‖, Unistar Publications .

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3.16 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Define Just in Time philosophy and discuss in detail with suitable examples.

Q.No.2 Discuss in detail the principles of JIT.

Q.No.3 List and discuss several of the JIT practices that can be applied to the purchasing Function.

Q.No.4 How do the suppliers benefit from JIT purchasing?

Q.No.5 List and discuss some of the characteristics of a JIT accounting system

Q.No.6 What is the key to the successful implementation of JIT? Q.No.7 Discuss in detail the uses of learning curve theory.

Q.No.8 What are to be considered as limitations of learning curve theory?

Q.No.9 Discuss in detail the applications of learning curve theory.

Q.No.10 Explain the learning curve ratio.

Q.No.11 Explain distinctive features of learning curve theory in manufacturing environment.

Q.No.12 What is a learning curve and why is it important?

UNIT-4

TARGET COSTING & LIFE CYCLE COSTING

STRUCTURE

4.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Introduction to target costing
- History of target costing
- Features of target costing
- Difference between Traditional Costing and Target Costing
- Objectives of Target Costing
- Target Costing Process
- Key Principles of Target Costing
- Meaning of Life Cycle Costing
- Steps for computing LCC
- Stages in Life Cycle Costing
- Advantages of Life Cycle Costing

4.2 Introduction: - Target costing is an approach to determine a product's life-cycle cost which should be sufficient to develop specified functionality and quality, while ensuring its desired profit. It involves setting a target cost by subtracting a desired profit margin from a competitive market price.

A target cost is the maximum amount of cost that can be incurred on a product; however, the firm can still earn the required profit margin from that product at a particular selling price. Target costing decomposes the target cost from product level to component level. Through this decomposition, target costing spread the competitive pressure faced by the company to product's designers and suppliers. Target costing consists of cost planning in the design phase of production as well as cost control throughout the resulting is the process of managing the entire lifecycle of a product from inception, through engineering design and manufacture, to service and disposal of manufactured product. The cardinal rule of target costing is to never exceed the target cost. However, the focus of target costing is not to minimize costs, but to achieve a desired level of process used by companies to reduce their costs and increase their profits determined by target costing process.

Target costing is a systematic approach to establishing product cost goals based on market driven standards. It is a strategic management process for reducing costs at the early stages of product planning and design. Target costing begins with identifying customer needs and calculating an acceptable target sales price for the product.

Working backward from the sales price, companies establish an acceptable target profit and calculate the target cost as follows:

Target Cost = Expected selling price – Desired profit

Target Costing is different from standard costing. While target costs are determined by market driven standards (target sales price – target profit = target cost), standard costs are determined by design – driven standards with less emphasis on what the market will pay (engineered costs + desired markup = desired sales price).

4.3 History of Target costing

In Japan, target costing is has gained importance and widely practiced in more than 80% of the companies in the assembly industries and more than 60% of the companies in processing industries. It emerged in Japan in 1960s as a moment of difficult market conditions. A proliferation of purchaser and industrial products of western firms were overcrowding the markets in Asia. Japanese companies were also experiencing shortages of resources and skills needed for the development of original concepts, tools and techniques, which were required to achieve parity with the toughest western competitors in terms of quality, cost and productivity. Many Japanese companies considered modified cross-functional activities, as used by western firms for manufacturing. They

believed that good upshots can be achieved by combining employees from scheme, planning, promoting, engineering, finance and production into expert teams. These teams were able to examine new methods and techniques for the design and development of new products and aimed at increasing the degree of integration between upstream and downstream activities of a firm's operations. Target costing thus emerged from this background. A range of specialized tools, including functional analysis, value engineering, value analysis and concurrent engineering were bring together to support the target costing. This made Japanese companies particularly effective in the area of product design and development. They were able to pinpoint all relevant elements to formulate a holistic management approach in order to achieve performance levels to meet the firm's objective.

Definition: - Target costing can be defined as ―a designed approach for determining the cost at which a proposed attract with specified functionality and quality must be produced to generate a desired level of cost-effectiveness at its anticipated selling price‖. A deadly aspect of this definition is that it lays stress on the fact that target costing is much more than a management accounting performance.

4.4 Features of Target Costing

1. It is a part of management course used for the cost reduction and cost management.

2. It gives much importance to customer's views, market settings and productivity.

3. It is careful as an integral part of produce design and introduction of new product.

4. It underscored the earning of at least target profit side from each product at any cost.

5. Under the target costing process, the target selling price is fixed on the basis of various sales forecasting techniques.

6. The fixing of selling price is based on the fitting of target production volumes since there is a rapport between price and volume.

7. The compulsory profit margin is comprised in the target selling price.

4.5 Difference between Traditional Costing and Target Costing

Traditionally, manufacturers would make use of the cost-plus method to estimate the product price. A starting point for them would be to conduct market study to determine its market segment's preferences and hence its

product's characteristics that will meet the customer's needs. This will be tracked by the design of the product. Next producer's process is determined.

Vendors will then be contacted to identify the total costs of the workings which are essential by the design and engineering divisions. Finally, cost components are summed up and a selling price is usual based on the costs.

If the management and the marketing department reflect that the price and cost are too high, the product design and business process will be repeated till an okay cost is got, after which, production will begin.

In gap, target costing grows an **"**allowable**"** product cost by first carrying out market research to predict what the market segment is willing to pay for the desired product with specific features. Subtracting the desired profit margin set by the management from the expected selling price, maximum target cost is reached at.This target cost is then compared to unlikely product cost and if it is higher than the expected product cost, the company has several options. First, to lower costs, the product design and/or the engineering process can be improved.

This is carried out by all the followers of the planning team (the suppliers, design, engineering, and production and marketing department) who will investigate the need and cost of each component.

All the associates will work together instead of going over various departments sequentially to reduce cost. When the target cost is reached, standards can be set and product will then enter the engineering phase.

4.6 Objectives of Target Costing

The fundamental objective of target costing is to enable board to use proactive cost planning, cost management and cost reduction performs whereby, costs are planned and managed out of a product and business, primary in the design and change cycle, rather to an during the later stages of product development and production. It obviously applies to new products, but car also be applied to product modifications or succeeding groups of products. It might also be used for existing products, but costs are more difficult to reduce once a product is developed and designed. Target costing is chiefly used and most active in the product development and strategy stage. The costs most typically emphasized in the target costing process are such things as: material and purchased parts, conversion costs (such as labour and identifiable overhead expenses), tooling costs, development expenses and reduction. However, all costs and assets that may be posh by early product planning decisions should be considered. This would include more indirect overhead expenses through the production period, and past, such as service costs, and assets like inventory. Target costing is intended to get managers thinking ahead and comprehensively about the cost and other implications of the decisions they make. Target costing is as much a major business viewpoint as it is a process to plan, manage and reduce costs. It emphasizes

understanding the markets and competition; it focuses on customer wants in terms of quality, purposes and delivery, as well as price; it recognizes the necessity to balance the tradeoffs across the organization, and establishes teams to address them early in the improvement cycle; and it has, at its core, the fundamental objective to make money, to be able to reinvest, grow and increase assessment.

4.7 Target Costing Process

Just as there is no single definition of target costing, there is no single target costing process.

Nevertheless, all companies share a series of general steps:

Establishing the target price in the context of market needs and competition;

b. Beginning the target profit margin;

c. Determining the acceptable cost that must be achieved; this cost should motivate all personnel to achieve;

d. Cunning the probable cost of current products and processes; and finally,

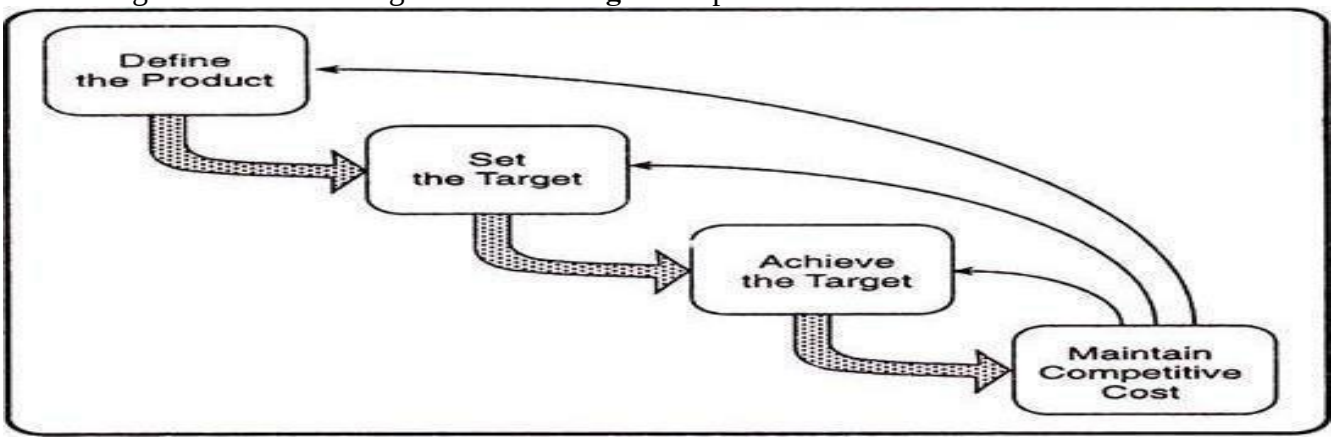
e. Launching the target amount by which up-to-date costs must be reduced.

Once the target cost has been calculated, companies take the following steps to achieve it:

a. Establishing a cross functional team, which is involved in the implementation process from the earliest design stages,

b. Using tools such as value manufacturing in the design process; and

c. Tracking cost cutbacks using **"kaizen costing"** once production has started.



A number of procedures and tools facilitate an effective and efficient costing process. Three outside oriented

analyses market charge tools, industry and competitive investigation and reverse engineering provide a firm with a foundation for defining the proposed new product and founding its price.

The fortitude of the target profit margin relies heavily on the comprehensive and detailed financial planning and statement analysis. Every firm has relationship among prices, volumes and revenues; costs and investments, in the aggregate and for specific product lines and individual products. The managing team should explore other tools like value exchange and worth function arrangement.

Formula

Where the profit margin is based on selling price, target total cost can be calculated as follows:

Target cost = selling price – profit percentage × selling price

Where the profit margin is based on cost, target cost can be found as follows:

$$\text{Target cost} = \frac{\text{selling price}}{1 + \text{profit percentage}}$$

Targets can be set for each individual cost component based on the standard costing.

Target Costing's Roots

The roots of target costing trace back to World War II when, due to a shortage of materials, U.S. manufacturers made an organized effort to build the most function into a product for the lowest cost. It was called value engineering. The Japanese adopted and expanded the concept in the 1960s and target costing was born — a long-term profit planning system that is customer-driven and price-led.

Today, 80 percent to 85 percent of all Japanese manufacturing companies use the concept, including well- known names like Sony, Toyota, Nissan, Canon, NEC and Olympus. However, it hasn't caught on in America. Even the few U.S. companies that have begun to use target costing, like Chrysler Corp. and The Boeing Co., are a long way from an integrated, companywide system.

4.8 Key Principles of Target Costing

According to Hilton, target costing involves seven key principles listed as follows:

Price-Led Costing

4.9 Key Principles of Target Costing

According to Hilton, target costing involves seven key principles listed as follows:

1. Price-Led Costing:

Target costing sets the target cost by first defining the price at which a product can be sold in the bazaar. Deducting the target profit border from this target price yields the target cost, that is, the price at which the product must be factory-made. Notice that in a target costing approach, the price is set first, and then the target product cost is determined. This is opposite from the order in which the product cost and selling price are determined under out-of-date cost-plus pricing.

2. Focus on the Customer:

To be successful at target costing, supervision must listen to the company's customers. What products do they want? What features are important? How much are they ready to pay for a certain level of product quality? Management needs to hostilely seek customer advice, and then products must be planned to satisfy customer demand and be sold at a price they are willing to pay. In little, the target costing approach is market driven.

3. Focus on Product Strategy:

Design engineering is a key element in target costing. Plans must design a product from the ground up so that it can be produced at its mark cost. This design activity includes specifying the raw materials and constituents to be used as well as the labour, machinery, and other elements of the production route. In short, a product must be designed for manufacturability.

4. Focus on Process Design:

Every aspect of the production process must be observed to make sure that the product is produced as efficiently as imaginable. The use of touch labor, technology, global sourcing in finding and every aspect of the production process must be designed with the product's target cost in mind.

5. Cross-Functional Teams:

Manufacturing a product at or under its target cost requires the involvement of people from many different functions in an organization: market research, sales, design engineering, procurement, production engineering, production scheduling, material treatment and cost management. Characters from all these various areas of expertise can make key contributions to the target costing process. Moreover, a cross-functional team is not a

set of specialists who contribute their proficiency and then leave; they are responsible for the entire product.

6. Life-Cycle Costs:

In specifying a product's target cost, experts must be careful to incorporate all of the product's life-cycle costs. These include the costs of product planning and concept design, preliminary design, comprehensive design and testing, making, distribution and customer service. Old-style cost-accounting systems have tended to focus only on the production phase and have not paid enough attention to the product's other life-cycle costs.

7. Value-Chain Orientation:

Occasionally the probable cost of a new product is above the target cost. Then efforts are made to eliminate non-value-added costs to bring the projected cost downcast. In some cases, a close look at the company's total value chain can help managers identify chances for cost reduction.

Target costing is a common practice in Japan where markets are very good. The market determines the price of products and there is a little prospect for the individual organizations to set prices. Therefore, monitoring cost is extremely important.

4.10 LIFE CYCLE COSTING

Introduction

Life Cycle Costing is the accumulation of costs for activities that occur over the entire life cycle of a product from the inception to the abandonment by the manufacturer and consumer. It focuses on total cost (capital cost+ revenue cost) over the products life including design, development, acquisition, operation, maintenance and servicing. Service costs include marketing, distribution administration and after sales service costs .Life cycle costing is an economic tool which combines both engineering art and science to make logical business decision. This analysis provides important input in the decision making process in the product design, development and use. The innovation of a new product and its degeneration into a common product is termed as the life cycle of a product.

Simple Formula of LCC :-

Capital + Lifetime operating costs + Lifetime maintenance costs + Disposal costs - Residual value

- **Why use LCC**

- Project Engineering:-Wants to minimize capital costs as the only criteria.
- Maintenance costs :- Wants to minimize repair hours as the only criteria
- Production :- Wants to maximize operation hours as the only criteria
- Reliability engineering:-Wants to nullify failures as the only criteria.
- Accounting:-Wants to maximize project net present value as the only criteria.
- Shareholders :-Wants to increase stockholder wealth as the only criteria.

4.11 Steps for computing of LCC :-

- **STEP 1:** Determine time for each cost element.
- **STEP 2:** Estimate value of each cost element.
- **STEP 3:** Calculate net present value of each element for every year.
- **STEP 4:** Calculate LCC by adding all cost element, at every year.
- **STEP 5:** Analysis the results.

- **STEP 1:** Determine time for each cost element.

Conventional concept of product life cycle implies to the time span based on demand of product in the market. Based on supplier data, customer decides the life cycle, i.e. how long he/she wants to use machine.

- **STEP 2:** Estimate value of each cost element. :-

Estimates monetary value for each cost element. This estimated value will be incurred in every year. This value is basically future income at each year, which is estimated.

- **STEP 3:** Calculate net present value of each element for every year.:-

The present value of the future income or future cost can be calculated by using discounting factor and inflation.

Discount Factor

The discount rate is an interest rate, a central bank changes depository institution that borrow reserve from it.

Inflation Factor

The inflation rate is the percentage by which price of goods and services rise beyond their average level.

- **Formula of Net Present value (NPV)**

$$PV = \frac{C\,(1+i/100)^{n-1}}{(1+d/100)^{n}}$$

Where

C = Any cost element at n^{th} year

I = Inflation rate

D = discount rate/ interest rate

- **STEP 4: :** Calculate LCC by adding all cost element, at every year.:-

Present value of each element is calculated for equipment (at every year)

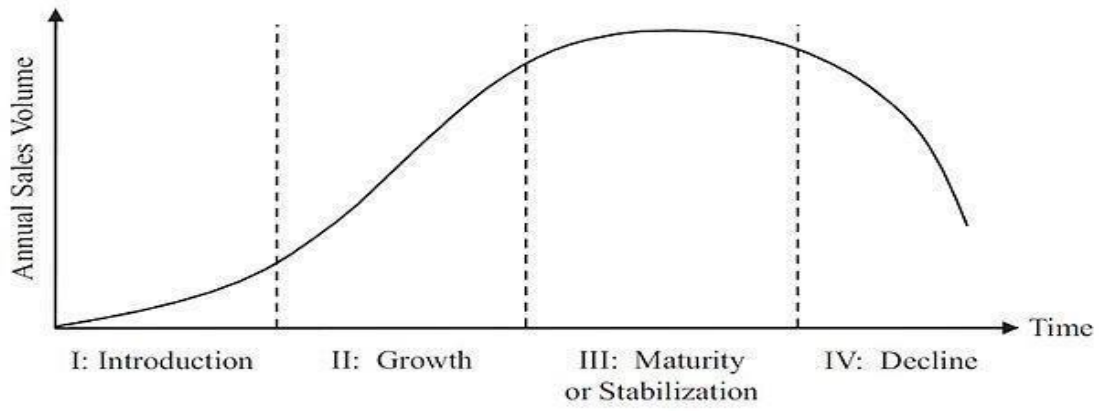
Present value of each element in a year is added. The process is done for every year over the life cycle. I.e., LCC is calculated for every year.

- **STEP 5:** Analysis the results

  - The dates collected from LCC are analyzed
  - If one product has to be selected among multiple equipments, then LCC is calculated for every product
  - Dates for every product are analyzed, and the lowest LCC option become preferred

But lowest LCC option may not necessarily be implemented when other considerations such as risk, available budget, political and environment concerns are taken into account.

4.12 Characteristics of PLC stages: There are five distinct phases in the life-cycle of a product as shown in this figure:



4.12.1 Introduction phase

After all research and development has been done it is time to commence the product and start on its lifecycle. The introduction stage of the product life cycle is when the marketing team emphasizes promotion and the product's primary distribution. Often the product will have petite or no competitors at this point. However, sales may stay low because it takes time for the market to admit the new product. At this stage of the life cycle, the company generally loses money on the product. This is the stage in which the product has been introduced first time in the market and the sales of the product starts to grow gradually and gradually and the profit received from the product is ostensible and non-attained. The market for the product is not competitive primarily and also the company spends initially on the advertisement and uses various other tools for promotion in order to encourage and produce awareness among the consumers, therefore generating discerning demands for particular brand. The products start to gain distribution as the product is initially new in the market and in this stage the quality of the product is not guaranteed and the price of the product will also be determined as low or high.

1. costs are very high
2. slow sales volumes to start
3. little or no competition
4. demand has to be created
5. customers have to be prompted to try the product makes little money at this stage

4.12.2 Growth phase

In the growth stage of the product life cycle, the market has acknowledged the product and sales start to rise. The company may desire to make improvements to the product to stay competitive. At this point, there are at rest somewhat few competitors. In the growth stage, the product is present already in the market and the consumers of the products are customary of the product and also there are speedy growth in the product sales as more new and new customers are using and trying and are fetching aware of the product. The customers are becoming satisfied from the product and they bought it again and again. The ratio of the product repetition for the trial procurement raised and also at this level, the competitors have started to overflow the market with more tempting and eye-catching inventions. This helps in creating increased competition in the market and also outcome in decreasing the product price.

1. costs reduced due to economies of scale
2. sales volume increases significantly
3. profitability begins to rise
4. public awareness increases
5. competition begins to increase with a few new players in establishing market increased competition leads to price decreases

4.12.3 Maturity Phase

In the maturity stage of the product life cycle, sales will arrive at their peak. Other competitors enter the market with alternative solutions, making competition in the market violent. The company that introduced the new product may begin to find it difficult to compete in the market. In maturity stage, the cost of the product has been decreased because of the increased volume of the product and the product started to skill the curve effects. Also, more and more competitors have seen to be leaving the market. In this way very few buyers have been left for the product and this result in less sales of the product. The turn down of the product and cost of attaining new buyers in this level is more as compare to the resulted profit. The brand or the product differentiation via rebating and discounts in price supports in recalling the outlet distribution. Also, there is a decline in the entire cost of marketing through enhancing the distribution and promotional efficiency with switching brand and segmentation.

1. costs are decreased as a result of production volumes increasing and experience curve effects
2. sales volume peaks and market saturation is reached
3. increase in competitors entering the market
4. prices tend to drop due to the proliferation of competing products
5. brand differentiation and feature diversification is emphasized to maintain or increase market share industrial profits go down

4.12.4 Decline Phase

In the decline stage of the product life cycle, sales will begin to decline as the product reaches its saturation point. Most products are phased out of the market at this point due to the decrease in sales and because of cutthroat pressure. The market will see the product as old and no longer in demand. In this stage, the profit as well as the sales of the product has started to decline because of the deletion of the product from the market.

The market for the product in this stage, started to show negative rate of growth and corroding cash flows. The product, at this stage may be kept but there should be fewer adverts.

1. costs become counter-optimal
2. sales volume decline
3. prices, profitability diminish
4. profit becomes more a challenge of production/distribution efficiency than increased sales

4.13 Advantages of Life Cycle Costing

1. It can provide important information for pricing decisions .This is essential in present-day context because for some products development period is relatively long and many costs are incurred prior and after manufacturing.
2. It helps the manager to develop insight and plan so that it is possible o generate revenue from the product; which covers cost relating to six categories i.e. research development ,product design , manufacturing, marketing, distribution, customer service.
3. It broadens the perspective of manager because complete life cycle relating to product is kept in view. Also it does not have calendar based focus, but considers whole life span of the product.
4. Manufacturing costs are highly visible in most accounting systems‖ However the costs associated with upstream areas (for example. research and development) and down-stream areas (for example. customer service) are often less visible at a product-by product level in the organisation following traditional costing. Life cycle costing finds solution to
   this problem.
5. Life cycle costing highlights inter-relationships across cost categories. Many companies who cut R & D costs, later experience major increase in customer service relation costs in subsequent years .The products of these companies also failed to meet promised quality performance level A life-cycle revenue and costs statement highlight hidden area, which get obscured in cost statements having calendar-based focus.
6. The life cycle costing is immensely useful in capital budgeting decisions (i.e., long-term decision-making). It considers both capital costs and revenue costs relating to the product over its life span .it makes explicit the trade –off between higher capital costs and lower maintenance running costs.

GLOSSARY TERMS

1. **Target Costing:** It is a disciplined process for determining and realizing a total cost at which a proposed product with specified functionality must be produced to generate the desired profitability at its anticipated selling price in the future.
2. **Life cycle**: Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal.
3. **Life cycle costing:**Life cycle costing, or LCC, is a compilation and assessment of all costs related to a product, over its entire life cycle, from production to use, maintenance and disposal.
4. **Life cycle inventory analysis**: It involves the compilation and quantification of inputs and outputs for a product throughout its life cycle.

4.14 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1. An estimated price, that is expected to be paid by customers for particular market offering is classified as

a. target price
b. target cost
c. outsource price
d. off shore price

2. An estimated cost per unit in long run, which enables company to achieve it's per unit target, operating income is classified as

a. target operating income per unit
b. target cost per unit
c. total current full cost
d. total cost per unit

3. Target price is subtracted from per unit target operating income to calculate

a. total current full cost
b. total cost per unit
c. target operating income per unit
d. target cost per unit

4. An income, which a company aims to earn by selling each unit of market offering is classified as

a. target operating income per unit
b. target cost per unit
c. total current full cost
d. total cost per unit

5. Process which leads to disassembling and analysis of competitors, operating activities to become acquainted with competitors' technologies is called

a. outsource engineering
b. reverse engineering
c. target engineering
d. off shore engineering

6. Which of the following statements regard life-cycle product costing and pricing is not correct?

a The product life cycle covers the time from initial research and development to the time at which the product is first sold to customers.

b. Life-cycle costing tracks costs attributable to each product from start to finish.

c. A product life-cycle budget highlights for managers the importance of setting prices that will cover costs in allvalue-chain categories.

d. Life-cycle costing is becoming increasingly important in light of Take-Back Laws in Europe, which make the costs of recycling and disposal of products the responsibility of the manufacturer.

7. A technique, which accumulates and tracks costs of business function in value chain attributed to each market offering from R&D to final customer support, is called

a. product life cycle\

b. life cycle budgeting
c. life cycle costing
d. target costing

8. In PLC stages, stage in which sales and profits declines is called
   a. a. decline stage
   b. b. less improved stage
   c. product maturity stage
   d. non-innovative stage

9. In PLC stages, stage in which company's investment costs mount is classified as
   a. a. testing stage
   b. b. development stage
   c. c. buying stage
   d. d. merger stage

10. Customers in growth stage of life cycle of products are classified as
   a. innovators
   b. early adopters
   c. middle majority customers
   d. laggards

CHECK YOUR PROGRESS-B(True or False):

1. In the product development stage of new-product development, products often undergo rigorous tests to make sure that they perform safely and effectively or that consumers will find value in them.
2. Growth stage of the PLC will involve promotional expenditures be low in an attempt to react to increasing competition.
3. Sales decline in the decline stage of the PLC because of technological advances, increased competition, and shifts in consumer tastes and preferences.
4. The major purpose of test marketing is to provide management with the information needed to make a final decision about whether to discontinue an existing product.
5. The search for new-product ideas should be systematic rather than haphazard.
6. A detailed version of a new idea stated in meaningful customer terms is called a sales concept.
7. An attractive idea must be developed into a product concept.
8. Decreasing profits will most likely occur at growth of the PLC.
9. In the growth stage, the firm faces a trade-off between high market share and high current profit.

10. In the concept testing stage of new-product development, a product concept in physical or symbolic form is presented to groups of target consumers.

ANSWERS TO CHECK YOUR PROGRESS-A

1.a 2.b 3.d 4.**a** 5.**b** 6.**a** 7.**c** 8.**d** 9.**b** 10.b

ANSWERS TO CHECK YOUR PROGRESS-B

1 True, 2 False, 3 True, 4 False, 5 True 6.False 7. True 8. False 9.True 10.True

4.15 REFERENCES

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4.16 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Define target costing. What are the advantages of target costing?

Q.No.2 What are the steps involved in implementing a target costing system?

Q.No.3 Explain in brief the main features of target costing.

Q.No.4 What is target costing and how it is useful in assessing a product's total life cycle cost?

Q.No.5 Does target costing require that profitability be viewed on a period-by-period basis or on a long term basis ? Explain.

Q.No.6 What are the stages of the product life cycle (PLC) in terms of the marketing or revenue producing perspective?

Q.No.7 What is Product Life Cycle Costing? Describe its characteristics and benefits.

Q.No.8 How is Life Cost Analysis prepared, implemented and monitored?

Q.No.9 What is Life Cycle Costing? Explain the stages in product life cycle.

Q.No.10 Give the main contents of a Life Cycle Costing Report?

UNIT-5

VALUE ANALYSIS & KAIZEN COSTING

STRUCTURE

5.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Meaning of value analysis
- Difference between value engineering and value analysis
- Benefits of value analysis
- Kaizen History
- Meaning of Kaizen
- Meaning of Kaizen Costing

- Kaizen event
- Kaizen Principles
- Hierarchy of KAIZEN involvement
- The five steps of good maintenance– 5s
- Standard vs. kaizen costing
- Advantages and disadvantages of Kaizen costing

5.2 Value Analysis

The value analysis methodology had its formal beginning by engineers at GEC during World War II when materials and labor were in short supply. It was tested and proved to be effective after many years of research. The technique was retitled as _Value Engineering‘ and developed and implemented widely used in industry as a cost saving tool.

Value Engineering may be defined as ―a systematic analysis and evaluation of the techniques and functions in the various spheres of an organization with a view to exploring channels of performance improvement so that the value in a particular product can be bettered.‖

US Department of Defence defines Value Engineering as 'an organized effort directed at analyzing the function of systems, equipments, facilities, services and supplies for the purpose of achieving essential functions at the lowest life cycle cost consistent with required performance, reliability, maintainability, interchangeability, product quality and safety. 'The basic issue is less cost at no sacrifice in performance and quality. It has emerged as an effective cost reduction technique in defence, space and consumer product industries.

'An analytical technique, designed to examine all the facets and costs of a product, in order to determine whether or not any item of cost can be reduced or eliminated, while retaining all functional performance and quality requirements.‘

It is important to note that the objective is to reduce costs without loss of quality or function. This means that value analysis is not undertaken by the Management Accountant working to isolation, but is a team task, with the team including designers, engineers, purchasing managers and accountants. The issue of cost is, therefore, not given total priority. The technique is one

equally applicable in both large and small companies. Although the volume will be lower in the latter case, the flexibility for change is greater and so the potential for savings is still present.

It is a systematic use of techniques which identify the required function, establish a value for the function, and finally provide the function at the lowest overall cost. It differs from pre-existing cost reduction activities in that it is function oriented, involving a searching analysis of the function of a product as opposed merely to seeking lower costs in methods and process to produce the same item it is a systematic and creative effort directed towards analyzing each item or task to ensure that its essential function is provided at the lowest overall cost.

5.3 Distinction between Value Engineering and Value Analysis

A distinction is made between Value Engineering and Value Analysis although commonly these two terms are used in the same sense. Value Analysis aims at reducing cost by economizing expenditure and increasing productivity and it probes into economic attributes of value and through continuous process of planned action aims to improve performance and increase the value in a product, and thereby reduce costs. Value Engineering concentrates mainly on direct costs. Value Engineering may be applied in the production stage i.e., in the design and development stage but value analysts applied to existing products already being marketed.

The economic value of a product is the combination of Use value, Cost value. Esteem value and Exchange value.

The term "value" has four different meanings

Cost Value – the sum total of material, labor, overheads and all other elements of cost required to produce an item or provide a service and the cost of purchase in case if obtained from outside.

Use Value – It refers to the characteristics and features which make the product useful for which it is intended. The use value is equal to the value of the functions performed

Esteem Value – the properties, features or attractiveness which creates a desire to possess the article but are not necessarily required so far as functional performance is concerned. It makes ownership of an objective desirable and makes it attractive which would induce customer to buy. A car of a particular company may be purchased for its more appealing look.

Exchange Value – the properties or qualities which will remain attractive enough to other people to permit market resale in the future. It refers to properties of an object that makes it possible to procure other items by trading, for instance, it is equivalent to its sale value in rupee.

Value Engineering is mainly concerned with use value and to some extent with the esteem value. Value Engineering is a 'structure' technique. It requires a sequential follow up of the job plan which extends from information to recommendation phase. The primary focus of the concept is on the identification and elimination of unnecessary function and thereby reduction of cost which do not add to the value. The elimination of unnecessary cost becomes easy when the concept converts the product cost into functional cost and it tries to develop an aversion to waste.

The concept has developed a unique technique known as FAST Diagram in order to identify the unnecessary function and thereby unnecessary cost. Function-cost-worth matrix is a tool which helps in ranking the functions having high value gap. Value engineering concept has not restricted to any particular tools. It not only uses brain storming technique, even statistical tools but also other tools like economic order quantity. Transportation models or, any other tools relevant to the situation. The value can be improved by improving cost function, cost remaining constant or by reducing cost. Function remaining constant or by improving function as well as reducing cost.

Value Matrix

Value Matrix		
Product	**Use value**	**Esteem value**
Brief Case	Hold things	Improve image
Color cement	Protect surface	Provide aesthetics
Wrist Watch	Show time	Enhance prestige

The Value Equation

Value = (Performance + Capability)/Cost = Function/Cost

Value is not a matter of minimizing cost. In some cases the value of a product can be increased by increasing its function (performance or capability) and cost as long as the added function

increases more than its added cost. The concept of functional worth can be important. Functional worth is the lowest cost to provide a given function. However, there are less tangible ―selling‖ functions involved in a product to make it of value to a customer.

Value Analysis can be defined as a process of systematic review that is applied to existing product designs in order to compare the function of the product required by a customer to VALUE ANALYSIS, VALUE ENGINEERING meet their requirements at the lowest cost consistent with the specified performance and reliability needed.

This is a rather complicated definition and it is worth reducing the definition to key points
And elements:

1. Value Analysis (and Value Engineering) is a systematic, formal and organized process of analysis and evaluation. It is not haphazard or informal and it is a management activity that requires planning, control and co-ordination.

2. The analysis concerns the function of a product to meet the demands or application needed by a customer. To meet this functional requirement the review process must include an understanding of the purpose to which the product is used.

3. Understanding the use of a product implies that specifications can be established to assess the level of fit between the product and the value derived by the customer or consumer.

4. To succeed, the formal management process must meet these functional specification and performance criteria consistently in order to give value to the customer.

5. In order to yield a benefit to the company, the formal review process must result in a process of design improvements that serve to lower the production costs of that product whilst maintaining this level of value through function.

5.4 Benefits of Value Analysis

Value analysis is a methodical approach to sharpening the efficiency and effectiveness of any

process. Often, businesses apply it to the processes used in product creation or service delivery. Paramount to the value analysis is the practice of breaking down a process into each individual component and considering ways to improve that component's value as measured by cost and importance to the process. General Electric developed value analysis during the late 1940s.

Reducing Costs

A critical advantage to using value analysis is its potential for reducing costs, which is a benefit that permeates all advantages of the system. Because value analysis breaks down a product or service into components, it enables you to analyze each component on its own, evaluating its importance and efficiency. A value analysis correctly implemented and applied allows you to identify components that are not worth the cost they require and that can be eliminated or replaced with an alternative. In this manner, the process for the product or service being analyzed is refined to be done at less expense.

Modernizing

The value analysis process often allows users to root out practices that have grown out of date and can be replaced with more modern approaches. This is particularly beneficial when something has been done the same way for an extended period of time. Because the old way works and was new when it was instituted, you have had little impetus to make changes. However, a value analysis, which calls for questioning every step of a process, can reveal new methods that are cheaper, more efficient and sometimes more effective.

Design Flaws

Value analysis can uncover design flaws that not only operate inefficiently but also create problems. In the case of a product, this could mean a high rate of malfunctioning items, creating customer complaints and warranty claims that put a strain on personnel and inventory. It also can lead to bad publicity and damage to the product brand and the company producing it. Similarly, in the case of a service, value analysis can help pinpoint design flaws in the customer support system that causes service to fall short of customer expectations.

Customer Satisfaction

Value analysis is oriented to weigh costs and the benefit to customers of a product or service. It forces you to consider every aspect of a process in the context of how it serves the customer, which could be a consumer or another business. This means that each step in the process is scrutinized and questioned from the perspective of the benefit that it provides the customer. If the benefit to the customer is small and the step is not necessary for the product or service as a whole, it can be eliminated, allowing you to streamline your operation and to reduce the use of resources.

In a nutshell, we can say that it enables to identify the areas which need more attention and improvement. It is an effective tool for cost reduction. It makes possible optimum use of all resources. It promotes innovation and creativity.

5.5 Summary: Value Analysis is a common sense but systematic method of reducing costs by taking each part of the product and looking in detail at its functions .It ensures that every feature, tolerance, degree of finish, piece of material or part of service is vetted to ensure that none of these is adding to the total cost without serving a necessary purpose .It ensures and maintains the desired quality products and suggest the manufacture of most suitable products.
It provides a method of generating ideas and alternatives for possible solutions to a concern. It is a tool for cost reduction It concentrates on customer satisfaction which lead to profitability of the organization. By a continuing search for improvement, it creates an atmosphere for increase of efficiency. It makes possible optimum use of all resources. It promotes innovation and creativity. It suggests improved methods of production and use of latest manufacturing techniques which have the effect of rising productivity and minimizing cost.
The process is sufficiently flexible. It can be repeated, explained and amended in the light of new or different information or challenge.

5.6 Kaizen History

The history of Kaizen begins after World War II when Toyota first implemented quality circles

in its production process. This was inclined in part by American business and quality management teachers who visited the country.

A quality circle is a collection of workers performing the same or similar work, who meet often to identify, analyze and solve work-related problems. This radical concept became very popular in Japan in the 1950s and continues to exist in the form of Kaizen groups as well as similar worker participation schemes. The term Kaizen actually became well-known around the world through the works of Masaaki Imai.

Masaaki Imai (born, 1930) is a Japanese organizational theorist and management consultant, known for his work on quality management, specially on Kaizen. In 1985 he founded the Kaizen Institute Consulting Group (KICG) to help western companies introduce the concepts, systems and tools of Kaizen. At present time, the Kaizen Institute team has applied the lean methodology and kaizen training courses across virtually all business sectors throughout the globe.

Masaaki Imai published two fundamental books on business process management ―Kaizen: Japanese spirit of improvement‖ (1985), which helped popularize the Kaizen concept in the West, and Gemba Kaizen: A Commonsense, Low-Cost Approach to Management (1997).

5.7 Kaizen costing Kaizen is a Japanese term comprising – KAI – change; ZEN – better (for the better) is a method of reducing managing costs. It's also referred to as continuous improvement costing. The method is aimed at cost reduction below standard level, but without negative effects on quality, staff, safety, etc. A process wherein a product undergoes cost reduction even when it is already on the production stage. The cost minimization can include strategies in effective waste management, continuous product improvement or better in acquisition of raw material. Kaizen is a Japanese term for continuous improvement in all aspects of an entity's performance at every level. Often associated with total quality management, many firms limit Kaizen to improving production

The idea is similar to target costing, where managers try to achieve the result with lower resources. However, target costing is used on design stage, while kaizen costing - during the

manufacturing stage. What's more important, kaizen costing requires high involvement of employees, while target costing - only some designers.

5.8 What is continuous improvement?

- Continuous improvement is the continual examination and improvement of existing processes and is very different from approaches such as business process re-engineering (BPR), which seeks to make radical one-off changes to improve an organization‘s operations and processes. The concepts underlying continuous improvement are:
- The organization should always seek perfection. Since perfection is never achieved, there must always be scope for improving on the current methods.
- The search for perfection should be ingrained into the culture and mindset of all employees. Improvements should be sought all the time.
- Individual improvements identified by the work force will be small rather than far-reaching.

Characteristics

Kaizen involves setting standards and then continually improving these standards to achieve long-term sustainable improvements.

- The focus is on eliminating waste, improving processes and systems and improving productivity.
- Involves all employees and all areas of the business.

Illustration – Kaizen

Many Japanese companies have introduced a Kaizen approach:

- In companies such as Toyota and Canon, a total of 60-70 suggestions per employee are written down and shared every year.
- It is not unusual for over 90% of those suggestions to be implemented.
- In 1999, in one US plant, 7,000 Toyota employees submitted over 75,000 suggestions, of

which 99% were implemented.

5.9 Kaizen Event

In modern usage, kaizen is designed to address a particular issue over the course of a week, which is referred to as a ―kaizen blitz‖ or ―kaizen event‖. A kaizen event is a focused development project that can accomplish breakthrough improvements in a short amount of time, about 2-10 days in scope. Kaizen events must have a clear, concise objective along with immediately available resources and rapid results. This ensures the results are significant, clear and quick to promote the generation of continued enthusiasm and satisfaction.

5.10 Principles of Kaizen

The Kaizen method follows ten specific principles, which are described below:

1. Improve everything continuously.
2. Eliminate old, traditional concepts.
3. Accept no excuses and make things happen.
4. Say no to the status quo of implementing new methods and assuming they will work.

5. If something is wrong, correct it.
6. Empower everyone to take part in problem solving.
7. Get information and opinions from multiple people.
8. Before making decisions, ask ―why‖ five times to get to the root cause. (5 Why Method)
9. Be economical. Save money through small improvements and spend the saved money on further improvements.
10. Remember that improvement has no limits. Never stop trying to improve.

Kaizen costing principles

- It lays no emphasis on the present existing situation, by disregarding all ideas implemented in the production process;
- The system does not strive for perfection, rather seeking gradual improvements in the existing situation, at an acceptable cost;
- It allows managers to exercise discretion in the application of their knowledge and personal skills;
- It encourages collective decision—making, i.e. the ideas of many are better than that of one single person;
- There are no limits to the level of improvements that can be implemented.
- Kaizen involves setting standards and then continually improving these standards to achieve long-term sustainable improvements.
- The focus is on eliminating waste, improving processes and systems and improving productivity.
- Involves all employees and all areas of the business

The 5 W and 1 H of Kaizen

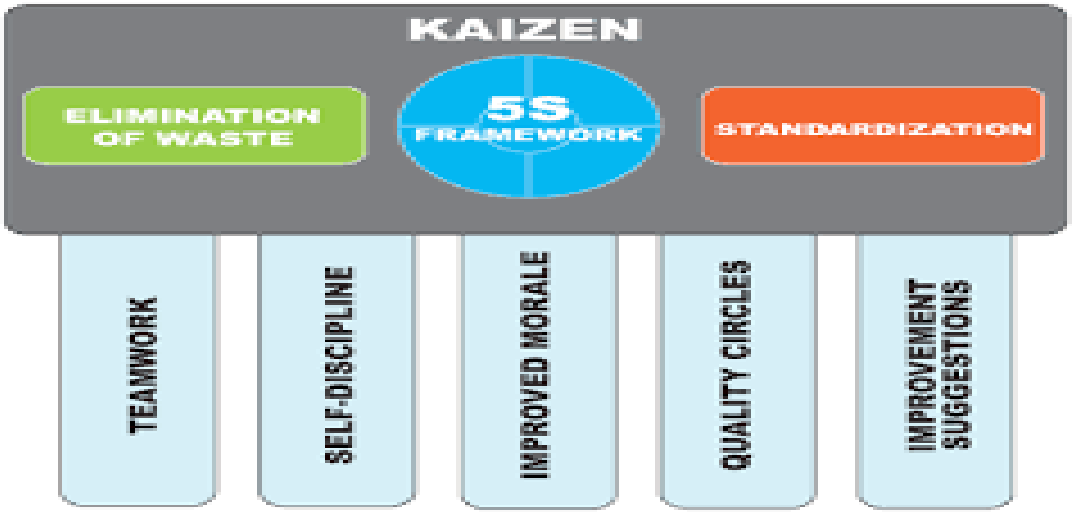
Who?	What?	Where?
1. Who does it? 2. Who is doing it? 3. Who should be doing it? 4. Who else can do it? 5. Who else should do it? 6. Who is doing 3-Mus?	1. What to do? 2. What is being done? 3. What should be done? 4. What else can be done? 5. What else should be done? 6. What 3-Mus are being done?	1. Where to do it? 2. Where is it done? 3. Where should it be done? 4. Where else can it be done? 5. Where else should it be done? 6. Where are 3-Mus being done?
When?	**Why?**	**How?**
1. When to do it? 2. When is it done? 3. When should it be done? 4. What other time can it be done? 5. What other time should it be done? 6. Are there any time 3-Mus?	1. Why does he do it? 2. Why do it? 3. Why do it there? 4. Why do it then? 5. Why do it that way? 6. Are there 3-Mus in the way of thinking?	1. How to do it? 2. How is it done? 3. How should it be done? 4. Can this method be used in other areas? 5. Is there any other way to do it? 6. Are there any 3-Mus in the method?

5.11 Hierarchy of KAIZEN involvement

POSITION	RESPONSIBILITIES
Top management	Be determined to introduce KAIZEN as a corporate strategy Provide support and direction for KAIZEN by allocating resources Establish policy for KAIZEN and cross-functional goals Realize KAIZEN goals through policy deployment and audits Build systems, procedures, and structures conducive to KAIZEN

Middle management and staff	Deploy and implement KAIZEN goals as directed by top management through policy deployment and cross-functional management Use KAIZEN in functional capabilities Establish, maintain, and upgrade standards Make employees KAIZEN-conscious through intensive training programs Help employees develop skills and tools for problem solving
Supervisors	Use KAIZEN in functional roles Formulate plans for KAIZEN and provide guidance to workers Improve communication with workers and sustain high morale Support small group activities (such as quality circles) and the individual suggestion system Introduce discipline in the workshop Provide KAIZEN suggestions
Workers	Engage in KAIZEN through the suggestion system and small group activities Practice discipline in the workshop Engage in continuous self-development to become better problem solvers Enhance skills and job performance expertise with cross-education

5.12 THE FIVE STEPS OF GOOD MAINTENANCE– 5S



In Japanese, 5S is the short form of five words which present the concept of good maintenance.

• SEIRI – Sorting – making the difference between necessary and useless things in GEMBA, giving up the useless ones.

• SEITON – Ordering/Arrangement – the ordering of all the items after SEIRI.

• SEISO – Cleaning and disturbance detection – the working areas/equipments will be clean.

• SEIKETSU - Standardizing– the extension of the cleaning concept to each individual alongside with the continuous practice of the three steps 3S.

• SHITSUKE – Disciplining – getting self-discipline and getting used to be each involved in the 5S actions through standard application.

Types of kaizen costing

There are two approaches to kaizen costing:

- Asset specific - all improvement activities are related to reduction of use of chosen asset or resource
- Product specific - improvement activities are related to different resources related to one

product

5.13 Standard vs. kaizen costing

The standard costing is approach to control costs looking at variances in comparison to actual costs. That becomes cause of the main criticism of standard costing. Managing by exceptions (only in case of variance) is not efficient enough. Kaizen costing goes further and improves costs continuously.

Kaizen costing	**Standard costing**
Cost reduction targets are set and applied monthly	Standards are set annually or semi-annually
Variance analysis involves target Kaizen costs versus actual cost reduction amounts	Variance analysis involves comparing actual to standard costs
Investigation occurs when target reductions are not attained	Investigation occurs when standards are not met

Kaizen cost targets

Targets for kaizen costs are set monthly based on following procedure:

1. Per product actual cost in the previous year = total actual cost of last year / actual production in last year
2. Estimated amount of total current year actual cost = Per product actual cost in the previous year * Estimated production for the current year
3. Kaizen cost target for the current year = Estimated amount of total current year actual cost * Ratio of cost reduction target
4. Assignment cost to each plant = Cost directly controlled in single plant / cost directly controlled in all plants

5. Kaizen cost target for each plant = Kaizen cost target for the current year / Assignment ratio

The Kaizen costing can use Hoshin Kanri approach of bottom-up path, where lower managers propose reduction levels. This however requires highly engaged staff..

5.14 Advantages and disadvantages of Kaizen costing

The main **advantages** are:

- Encouraging and empowering employees lead to better results
- Employee suggestion system helps to find ways of cost reduction
- Lean thinking helps reducing resources absorption

The potential **disadvantages** are:

- Kaizen is a permanent change system
- Kaizen can increase the burden on lower level of management
- Kaizen costs can lead to diminishing returns if not implemented wisely

5.15 SUMMARY

The KAIZEN principles presumes a practical approach and low costs of improvement. The Kaizen management system is based on the continuous loss reduction by means of methods that do not rely on investments, but on the improvement of the processes and the employees‘ performance. According to the Kaizen principles, we must be sure that, when we take an action, our action will go on in the best possible way and is not merely an intermediate action to generate a temporary result.

• KAIZEN – must be a way of being, an attitude, a spirit to be permanently present within each team; Our lifestyle, both at home and at work, should focus on our constant efforts to improve; The application of the Kaizen principles supposes a continuous dialogue between the manager and the employees (vertical communication) on the one hand, and between the employees on the same hierarchical level (horizontal communication), on the other hand.

• The application of the Kaizen principles involves no major expenses, but only more attention to details and practical ways to do things better and more efficiently; Problems

should not be connected to people because blaming people does not solve the problem; Each approach should start with highlighting the positive parts; We should not judge or blame; we should use feed-back techniques.

Unlike the European management, the Japanese management focuses on the active involvement of all staff categories in the process of continuous improvement. The directly productive staff is particularly encouraged so that they can suggest and make improvements. After a detailed analysis, we have noticed that, even in the areas where we consider no improvements are needed, there are still plenty of possibilities to improve. A good management of human resources in the organization is one of the strategic objectives of the organization which should be clearly defined and accepted by all its members. The Kaizen principles are the resistance structure that should be built on, so that we can get to a continuous, step by step improvement of the company performance.

KEYWORDS

1. Kaizen: A Japanese term that means gradual unending improvement by doing little things better and setting and achieving increasingly higher standards. Masaaki Imai made the term famous in his book, Kaizen: The Key to Japan‘s Competitive Success.

2. Kanban: A Japanese term for one of the primary tools of a just in- time system. It maintains an orderly and efficient flow of materials throughout the entire manufacturing process. It is usually a printed card that contains specific information such as part name, description and quantity.

3. Value: It may be defined as the ratio of function to cost.

4. Value Chain: It covers all the activities that a firm uses to design, produce, market, deliver andsupport its product.

5. Value engineering: It is a systematic method to improve the "value" of goods or products and services by using an examination of function.

6. Facilitator: Value Analysis team leader who manages and facilitates the VA workshop or job plan.

7. FAST: Function Analysis System Technique, is a graphical modelling technique used within Function Analysis, to identify relationships between functions based on the questions: How, and Why.

8. Value Analysis Team: A multi-disciplinary group representing different perspectives and

skills and relevant to the project, product or process, which is the object of the analysis.

5.16 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1- The cost reduction technique in comparison to the worth of a product is known as

a) Reverse engineering
b) Value engineering
c) Material engineering
d) Quality engineering

2- Value analysis examines the

a) Design of every component
b) Method of manufacturing
c) Material used
d) All of the above

3- Value analysis is normally applied to

a) New products
b) Old products
c) Future products
d) Both (a) and (b)

4- Value can be defined as the combination of_____which ensures the ultimate economy and satisfaction of the customer.

a) Efficiency, quality, service and price
b) Efficiency, quality, service and size
c) Economy, quality, service and price
d) Efficiency, material, service and price

5- Value is the cost directly proportionate to

a) Price
b) Function
c) Product Material
d) All of the above

6- The price paid by the buyer is

a) Cost value
b) Use value
c) Esteem value
d) Exchange value

7- Value Analysis is a----------process.

a) Remedial
b) Preventive
c) Continuous
d) None of the above

8- Who is the father of value analysis?

a) Lawrence D.Miles
b) George Terborgh
c) Michael Jucius
d) Edwin B.Flippo

9- The cost incurred by the manufacturer beyond use value is called

a) Cost Value
b) Esteem Value
c) Exchange Value
d) None of the above

10- Value Analysis should be applied when the following symptom(s) is (are) present

a) Rate of return on investment is reducing
b) Reduction in sales of the product
c) Firm is unable to meet delivery promises
d) All of the above

11. Which Japanese term refers to continuous improvement?

a) Kaizen
b) Kanban
c) Seri
d) Seito

12. What is the Japanese word for ‗real place', where the value-adding activities to satisfy the customer are carried out?

a) Kaizen
b) Gemba
c) Gembutsu
d) Seri

13. Which of the following metric is used in Kaizen implementation?

a) Takt time
b) Turnaround time
c) Cycle time
d) Average count of defective part

14. Which Japanese word means some unconformable physical or tangible things like out of order equipment or scrap which can be felt?

a) Kaizen
b) Gemba
c) Gembutsu
d) Seri

True or False:

1. Value Analysis is not an effective tool for cost reduction.
2. Value Analysis is not a creative approach for finding out unnecessary costs.
3. The relationship of value, function and cost can be expressed as Cost= Value/Function
4. Value Analysis a systematic identification of unnecessary costs.
5. Value Analysis lays emphasis on searching out new ideas while cost reduction is usually confined to already known facts.
6. Kaizen Costing emphasis on continuous improvement.
7. Carrying out small improvements in large numbers with total employee involvement, on a continuous basis.
8. English language is referred to when using the term Kaizen.
9. The term PDCA is the closest in meaning to the term Kaizen?

ANSWERS TO CHECK YOUR PROGRESS-A

1.b 2.d 3.b 4.a 5.b 6.b 7.a 8.a 9.b 10.d 11.a 12.b 13.d 14.c

ANSWERS TO CHECK YOUR PROGRESS-B

1 False, 2 False, 3 False, 4 True, 5 True,6 True,7 True 8. False 9.True

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5.18 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Briefly explains the concept of value analysis as a cost reduction technique.

Q.No.2. What are the advantages of value analysis

Q.No.3 How does Kaizen Costing affect organisational culture?

Q.No.4 Comment on the statement‖ Kaizen costing is applied to drive continuous process improvement".

Q.No.5 Write Short Notes on:

(A) TQM

(B) Kaizen Five s framework.

(C) Steps for the implementation of Kaizen.

(D) the relationship between value, function and cost.

UNIT-6

Total Quality Management

STRUCTURE

6.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

1 Origin of TQM

2 Meaning of Quality

3 Meaning of TQM

4 Advantages of TQM

5 Total Quality Management Principles
6 Seven C‘s of Total Quality Management
7 Philosophy of Quality Gurus

8 Cost of Quality Reporting

6.2 Origin of TQM

Total quality management has evolved from the quality assurance methods that were initial developed around the time of the First World War. The war attempt led to large scale

manufacturing efforts that frequently produced poor quality. To help correct this, quality inspectors were placed on the production line to ensure that the level of failures due to quality must be minimized.

After the First World War, quality inspection was popular in manufacturing environments and this makes to the lead to the introduction of Statistical Quality Control (SQC), and a theory was developed by Dr. W. Edwards Deming.

A statistical method of quality based on sampling was undertaken. Where it was not feasible to inspect each and every item, a sample was tested for quality. The theory of SQC was based on the opinion that a deviation in the production process leads to deviation in the end product.

If the deviation in the process could be separated this would lead to a higher level of quality in the finished product. After World War Two, the industrial manufacturers in Japan produced poor quality items. In a reaction to this, the Japanese Union of Scientists and Engineers invited Dr. Deming to guide engineers in quality processes.

By the 1950‘s quality control was a vital part of Japanese manufacturing and was adopted by all levels of workers within an organization. By the 1970‘s the idea of total quality was being thinking to implement. This was seen as company-wide quality control that involves all employees from top management to the workers, in quality control. In the next decade more non-Japanese companies were introducing quality management procedures that based on the results seen in Japan.

The new gesticulate of quality control became known as Total Quality Management, which was used to explicate the many quality-focused strategies and techniques that became the core of focus for the quality movement.

Before to understand the meaning of ―Total quality management‖, let us first know what does Quality mean?

6.3 Meaning of Quality

Quality refers to a main and important factor which decides the superiority or inferiority of a product or service. Quality can be defined as a characteristic which differentiates a product or service from its competitors. Quality acts an important role in every business. Business marketers need to put emphasis on quality of their brands over quantity to stay alive the cut throat competition.

Why would a customer come to you if your competitor is also offering the same product? The distinction has to be there in quality. Your brand needs to be better-quality for it to stand spaced out from the rest.

6.4 Total Quality Management

Total Quality management is defined as a permanent effort by the management as well as employees of a particular organization to ensure long term customer loyalty and customer satisfaction. Always remember, one happy and satisfied customer brings ten new customers along with him whereas one disappointed individual will stretch bad word of mouth and spoil a number of of your existing as well as prospective customers. Total quality management is a normally improving the operations of a business. This is done through the application of process analysis by every concerned employee and business partners. TQM is usually useful at the front-line level, where production, clerical, and low-level managers are intensely involved. There are a number of tools available to assist in a TQM effort, such as

- Accounting
- Field servicing
- Finance
- Legal and administration
- Maintenance
- Manufacturing
- Materials management
- Research and development
- Sales and marketing

Quality can be calculated in terms of durability, reliability, custom and so on. Total quality management is a planned effort by employees to constantly improve the quality of their products and services through proper feedbacks and research. Ensuring superior quality of a product or service is not the accountability of a single member.

Every individual who receives his/her pay check from the organization has to contribute equally to design fool proof processes and systems which would finally ensure superior quality of products and services. Total Quality management is definitely a joint effort of management, staff members, workforce, and suppliers in order to meet and surpass customer satisfaction level. You

can‘t just blame one person for not adhering to quality measures. The responsibility lies on the shoulder of everyone who is even tenuously connected with the organization.

W. Edwards Deming, Joseph M. Juran, and Armand V. Feigenbaum in cooperation developed the concept of total quality management. Total Quality management originated in the manufacturing sector, but can be applied to approximately all organizations.

Total quality management ensures that every single employee is working towards the improvement of work culture, processes, services, systems and so on to ensure long term success.

6.5 Advantages of Total Quality Management

1. Emphasizing the needs of the market

TQM helps in prominence the needs of the market. Its application is universal and helps the organisation to recognize and meet the needs the market in a improved way.

2. Assures better quality performance in every field of activity

Unfavourable and non-participative attitudes of the employees are the biggest obstacles in the organization‘s success, growth and advancement. TQM stresses on bringing attitudinal changes and improvements in the performance of employees by promoting proper work culture and effective team work. It provides excellent opportunities for self development and increasing employee‘s interest in the job.

3. Helps in examination non-productive activities and waste

Every organisation aims at improving productivity as well as reduction in cost so as to result in increase in profitability. Under TQM, quality improvement teams are constituted to reduce waste and inefficiency of every king by introducing systematic approach. Such efforts are helpful in achieving cost-effectiveness and safety in the organisation.

4. Helpful in meeting the competition

TQM techniques are greatly helpful in understanding the competition and also developing an effective skirmishing strategy. Due to the cut throat competition, the very endurance of many organisations has become very important issue. TQM helps in understanding the customers as well as the market. It provides an opportunity to the organisation to meet up the competition by

resorting to the techniques of TQM.

5. It helps in increasing an adequate system of communication

Faulty and derisory communication and indecent procedures act as hesitant blocks in the way of proper development of an organisation. It results in misapprehension, low- productivity, poor quality, duplication of efforts and low morale. TQM techniques connect together members of various related sections, departments and levels of management for effective communication and interface.

6. Continuous review of progress

TQM helps to review the process needed to develop the strategy of never ending improvement. Quality improvement efforts have to be undertaken continuously to meet the dynamic challenges. From the above, it can be concluded that TQM results in both tangible and intangible gains.

7. Morale

The uncompleted and proven success of TQM, and in particular the involvement of employees in that success can escort to a perceptible improvement in employee morale, which in turn reduces employee turnover, and therefore reduces the cost of hiring and training new employees.

6.6 Total Quality Management Principles

.In order to exceed customer expectations, an organization must embrace five principles:

1. Produce quality work the first time
2. Focus on the customer
3 Have a strategic approach to improvement
4. Improve continuously
5. Encourage mutual respect and teamwork

Producing quality work (the first time) means quality is built into the processes for producing products or providing services, and ways are taken to ensure the processes work every time.

Employees are empowered to make decisions to recover a process and are provided with continual training to develop their skills.

Focusing on the customer involves designing products or services that meet or the customer's prospect. This involves the product itself, its functionality, attributes, expediency and even the means by which the information about a product is received by a client.

By **having a strategic approach to improvement**, processes are developed and tested to ensure the product or service's quality. This also involves making sure suppliers offer quality supplies needed to produce products.

Improving continuously means always analyzing the way work is being performed to determine if more effective or efficient ways are possible, making improvements and determined for excellence all the time.

Encouraging mutual respect and teamwork is significant because it fosters a single-organizational culture of fineness by knowing that every employee from top to bottom of the pecking order holds the identical core principles at heart.

Total Quality management can be divided into four categories:

- Plan
- Do
- Check
- Act

Also referred to as PDCA cycle.

Total quality management ensures that every single employee is working towards the improvement of work culture, processes, services, systems and so on to ensure long term success.

Planning Phase

Planning is the most crucial phase of total quality management. In this phase employees have to come up with their problems and queries which need to be addressed. They need to come up with the various challenges they face in their day to day operations and also analyze the problem‘s root cause. Employees are required to do necessary research and collect relevant data which would help them find solutions to all the problems.

Doing Phase

In the doing phase, employees develop a solution for the problems defined in planning phase. Strategies are devised and implemented to overcome the challenges faced by employees. The effectiveness of solutions and strategies is also measured in this stage.

Checking Phase

Checking phase is the stage where people actually do a comparison analysis of before and after data to confirm the effectiveness of the processes and measure the results.

Acting Phase

In this phase employees document their results and prepare themselves to address other problems.

6.7 Seven C's of Total Quality Management

6.7.1 CULTURE

Training lies at the centre of effecting a change in culture and attitudes. Management accountants, too often associate _creativity' with _creative accounting' and associated negative perceptions. This must be changed to encourage individual contributions and to make _quality' a normal part of everyone's job.

6.7.2 COMMUNICATIONS

During times of organizational change, as well as part of day-to-day operation, effective communications plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, method, and timeliness.

These elements are considered so essential to TQM that many organizations define them, in some format, as a set of core values and principles on which the organization is to operate. The methods for implementing this approach come from the teachings of such quality leaders as Philip B. Crosby. Edwards Deming, Armand V. Feigenbaum, Kaaru Ishikawa and Joseph M. Juran.

6.7.3 CONTINUOUS IMPROVEMENT

Continuous improvement. Total quality management is not a short term activity that will finish, when a set target has been achieved. It is not a programme or a project. It is a management process that recognizes that however much a company may improve, competition will continue to improve and customer will expect more of us. Continuous improvement is an incremental

change and not a breakthrough, when should be the aim of all who wish to undertake the TQM,normally initial desires fizzle ,excitement wanes and momentum disappears but in case of TQM it does not happen. In case of TQM, methodology of continuous improvement is adopted as a way of life. Tools and concepts of TQM require a structure a sequenced set of activities to follow.

6.7.4 CUSTOMER FOCUS AND SATISFACTION

In the words of Joel Ross, quality begins and ends with customer‘s .for TQM, it is necessary to examine company‘s relationship with customers and its knowledge of customer requirements and of quality factors that drive market price competition. Special emphasis is on company‘s methods to determine customer satisfaction, current trends and levels of customer satisfaction and retention. The widespread tendency to ignore complaints or track them and identify the causes can have serious consequences. This is particularly true in services. The customer ultimately determines the level of quality. No matter what an organization does to foster quality improvement—training employees, integrating quality into the design process, upgrading computers or software, or buying new measuring tools—the customer determines whether the efforts were worthwhile.

6.7.5 COMMITMENT

For success of TQM involvement or rather commitment of top management is essential. Top management must become convinced of the need for quality and must clearly communicate this to entire company by written policy, stating that each person is expected to perform according to the requirement or cause the requirement to be official changed to what the company and the customers really need.

6.7.6 COOPERATION

TQM does not mean conforming to a set routine. It requires involvement, participation and imagination of employees. Efforts are made to make best use of on the job experience of employees. For continuous improvement imposition on employees some set guidelines will not

to do. For TQM employees have to be inspired to involve with the project /product/process mentally. This cooperation and participation of employees is essential for TQM.

6.7.7 CONTROL

Imposition on employees is avoided. Rather they are invited to participate in development and execution, but a still control mechanism is essential for success of TQM. It will call for a system of documentation and feed- back .this may require collection analysis of data and use of statistical method, etc.

6.8 COST OF QUALITY

In the environment of competition, a business enterprise can only survive through maintenance of quality of the goods and services offered by adding value to the product or service. Quality is the most important factor which provides the competitive edge to an organisation .The quality improvement results in greater satisfaction to customers and also manufacturers gain considerable amount of deduction in the overall operation costs. It is clear that management must consider very carefully the level of quality that is to be offered by the products as well as their price and cost levels. This need for balancing these dimensions.

6.9 CLASSIFICATION OF QUALITY COSTS: These are the main three of cost to be identified, measured and improved. These are:

1. Cost of conformance
2. Cost of non-conformance
3. Cost of loss opportunities

6.9.1 COST OF CONFORMANCE

The cost of conformance has two aspects-cost of prevention and cost of appraisal.

Prevention Costs-These are the costs associated with trying to prevent failure from happening. The cost incurred before the base of activity on ensuring that the base activities will be done right first time. Employee quality training and quality engineering are included in prevention

cost. Cost of prevention is the cost of activities that prevent failure from occurring. Examples include training employees, quality awareness programmes, planning and quality workshops or quality circles.

Appraisal costs-These costs incurred to determine conformance with quality standards. These costs that the company incurs in order to limit its failure costs. Inspection and testing costs for (a) Incoming material (b) Manufacturing expenses(c) Products at all stages of manufacture and use etc.fall into this category. Cost areas such as inspection, checking, test, quality audit surveys etc.Cost of appraisal is the cost incurred to determine conformance with quality standards. Examples include inspecting, checking, auditing and expediting because parts or reports are not delivered on time.

6.9.2 COST OF NON-CONFORMANCE

Cost of non-conformance encompasses three Aspects.

Cost of internal failure – This is the cost of correcting products or services which do not meet quality standards prior to delivery to the customer. Examples include scrap and rework. Internal failure costs are those which occur with the organisation before delivery to the external customers. The cost arising within the manufacturing organisation such as scrap, spoilage, reworked material etc are internal failure costs. These costs are incurred on correcting defects and discovered prior to delivery to the customer. In manufacturing this would include scrap and rework, design, changes during production and surplus goods and obsolete inventory.

Cost of external failure- There is the cost of external failure-correcting products or services after delivery to the customer. Examples include warranty costs, installation of field retrofits, customer invoice errors/adjustments and unplanned field service costs. External failure costs occur when the product or service is offered to the customer and found defective. These costs include returned products and rejected services or unhappy customers. The costs arising outside the manufacturing organisation such as customer complaints, warranty claims etc.are external failure costs. These costs are incurred after the delivery of the product.

Cost of exceeding requirements-This is the cost incurred providing information or services which are unnecessary or unimportant, or for which no known requirement has been established .Examples include redundant copies of documents, reports which are not read, detailed analytical effort when scope estimates would suffice and sales calls which are not required by the customer.

6.9.3 COST OF LOST OPPORTUNITY

Perhaps the most difficult cost of quality to quantify is the cost of lost opportunities. This is the lost revenue resulting from the loss of existing customers, the loss of potential customers and the lost business growth arising from the failure to deliver products and services at the required quality standards. Examples include, cancellations due to inadequate service response times, ordering of competitors‘ products because the company‘s products are not available, and the wrong products offered for the specific customer‘s application.

The cost of quality is the sum of lost of conformance, lost of non conformance and cost of lost opportunity.

OPTIMISATION OF QUALITY COSTS

Most of the organisations now measure only the internal and external failure costs. The management‘s attention is drawn to quality problems when the external failure cost is very high .Initially managers will be tempted to control the external failure costs by spending more on the appraisals to detect the defects before delivery of products. This will result in the increase of appraisal cost and internal failure cost as more defects will be noticed before delivery. But the external failure cost will come down. The impact of this strategy on the total cost is negligible as the reduction in the external failure cost will be compensated by increase in the appraisal and internal failure cost.

The right strategy for the reduction in quality cost will be to spend more on preventive costs, in which case, there will be substantial reduction in the total quality cost. The reason for the favourable cost result of this strategy is that a small increase in the prevention cost reduces considerably, the appraisal, internal and external failure costs.

The quality cost reduction is achieved in the following two stages:

First, when prevention costs are increased to pay for the right kind of systems engineering work in quality control reduction will occur in rejection, defect and rework of output.

Second, a reduction in defective output will have a positive effect on appraisal costs because defect reduction means a reduced need for routine inspection and test activities. It follows that as prevention is increased the need for appraisal decreases. The end result is a substantial reduction in the cost of quality and an increase in the level of quality.

6.10 QUALITY COST REPORTING

The quality costs are not simply monitored in an ad hoc fashion. They are compared against a budget. The quality cost report contains the target and actual classified under the categories of prevention, appraisal, internal and external failure costs. It may be supported by financial ratios and trend analysis related to the business of the company. The cost report usually contains the percentages of prevention, appraisal, internal and external failures to total quality cost. The quality cost may also be expressed as a percentage to sales, value added and labour cost. The report format and frequency will depend upon the nature of the business and the level of management to which the information is presented. The major sources of collection of quality cost data are customer complaints, production yield ,process control, pay roll analysis ,inspection and test records etc.

6.11 COST OF LOSS OPPORTUNITY

What is a quality guru?

A guru, by definition, is a superior person, a shrewd person and a teacher. A quality guru should be all of these, plus have a concept and come within reach of to quality within business that has made a major and permanent impact. The gurus mentioned in this section have done, and continue to do, that, in some cases, even after their death.

Philip Crosby:

The Four Absolutes of Quality Management:

- Quality is conformance to requirements
- Quality prevention is preferable to quality inspection
- Zero defects is the quality performance standard
- Quality is measured in monetary terms – the price of non-conformance

14StepstoQualityImprovement:

1. Management is committed to quality – and this is clear to all
2. Create quality improvement teams – with (senior) representatives from all departments.
3. Measure processes to determine current and potential quality issues.
4. Calculate the cost of (poor) quality
5. Raise quality awareness of all employees
6. Take action to correct quality issues
7. Monitor progress of quality improvement – establish a zero defects committee.
8. Train employees in quality improvement
9. Hold ―zero defects‖ days
10. Encourage employees to create their own quality improvement goals
11. Encourage employee communication with management about obstacles to quality
12. Recognize participants‘ effort
13. Create quality councils
14. Do it all over again – quality improvement does not end

Deming's 14 Points of Quality

W Edwards Deming placed great significance and accountability on management, at the individual and company level, believing management to be responsible for 94% of quality problems. His fourteen point plan is a complete way of life of management that can be applied to small or large organizations in the public, private or service sectors:

1. Create constancy of purpose towards improvement of product and service.

2. Adopt the new philosophy. We can no longer live with commonly accepted levels of delay, mistakes and defective workmanship.
3. Cease dependence on mass inspection. Instead, require statistical evidence that quality is built in.
4. End the practice of awarding business on the basis of price.
5. Find problems. It is management‘s job to work continually on the system.
6. Institute modern methods of training on the job.
7. Institute modern methods of supervision of production workers. The responsibility of foremen must be changed from numbers to quality.
8. Drive out fear, so that everyone may work effectively for the company.
9. Break down barriers between departments.
10. Eliminate numerical goals, posters and slogans for the workforce asking for new levels of productivity without providing methods.
11. Eliminate work standards that prescribe numerical quotas.
12. Remove barriers that stand between the hourly worker and their right to pride of workmanship.
13. Institute a vigorous program of education and retraining.
14. Create a structure in top management that will push on the above points every day

Dr. Kaoru Ishikawa

- Known as father of Japanese quality control effort
- Established concept of Company Wide Quality Control (CWQC) – participation from the top to the bottom of an organization and from the start to the finish of the product life cycle
- Started Quality Circles – bottom up approach – members from within the department and solve problems on a continuous basis
- The fishbone diagram is also called Ishikawa diagram in his honor
- Introduced concept that the next process is your customer

Dr. Joseph Juran

Juran’s Quality Trilogy(compared to financial management):

- **Quality planning** (financial budgeting) – create process that will enable one to meet the

desired goals

- **Quality control** (cost control) – monitor and adjust the process
- **Quality improvement** (profit improvement) – move the process to a better and improved state of control through projects

Key points of Juran's approach to quality improvement:

- Create awareness of the need for quality improvement
- Make quality improvement everyone's job
- Create infrastructure for quality improvement
- Train the organization in quality improvement techniques
- Review progress towards quality improvement regularly
- Recognize winning teams
- Institutionalize quality improvement by including quality
- Concentration on both external and internal customers

However, TQM also requires a significant training period for those employees involved in it. Since the training can take people away from their regular work, this can actually have a negative short-term result on costs. Also, since TQM tends to result in a continuing series of incremental changes, it can produce an unfavorable reaction from those employees who have a preference the current system, or who feel that they may lose their jobs because of it.

TQM works most excellent in an environment where it is powerfully supported by management, it is implemented by employee teams, and there is a frequent focus on process improvement that prevents errors from happening.

6.12 Summary

TQM encourages participation amongst shop floor workers and managers. There is no single hypothetical formalization of total quality, but Deming, Juran and Ishikawa provide the core assumptions, as a ―discipline and philosophy of management which institutionalizes planned and continuous improvement and assumes that quality is the result of all activities that take place within an organization; that all functions and all employees have to contribute in the

enhancement process; that organizations need both quality systems and a quality culture.‖

KEYWORDS

1. Inspection cost: The cost associated with inspecting a product to ensure it meets the internal or external customer‘s needs and requirements; an appraisal cost.

2. Prevention cost: The cost incurred by actions taken to prevent a nonconformance from occurring; one element of cost of quality or cost of poor quality.

3. Six Sigma quality: A term generally used to indicate process capability in terms of process spread measured by standard deviations in a normally distributed process.

4. Total quality: A strategic integrated system for achieving customer satisfaction that involves all managers and employees and uses quantitative methods to continuously improve an organization‘s processes.

5. Total quality control (TQC): A system that integrates quality development, maintenance and improvement of the parts of an organization. It helps a company economically manufacture its product and deliver its services.

6. Total quality management (TQM): It is a management approach to long-term success through customer satisfaction. TQM is based on all members of an organization participating in improving processes, products, services and the culture in which they work.

7. Zero defects: A performance standard and method Philip B. Crosby developed; states that if people commit themselves to watching details and avoiding errors, they can move closer to the goal of zero defects.

6.13 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1. Malcolm Baldrige national quality award is for (MBNQA)

a) Total Quality Management

b) International Standard Organization

c) Total Productive Maintenance

d) Total Quality Control

2. Control chart is a

a. Process monitoring tool

b. Process control tool

c. Both (a) and (b)

d. None of the above

3. The objective of ISO-9000 family of Quality management is

a. Customer satisfaction

b. Employee satisfaction

c. Skill enhancement

d. Environmental issues

4. The following is (are) the machine down time.

a. Waste

b. No material

c. Breakdown

d. All of the above

5. TQM & ISO both focuses on

a. Customer

b. Employee

c. Supplier

d. All of the above

6. According to Deming, Quality problems are

a. Due to management

b. Due to method

c. Due to machine

d. Due to material

7. Match The Following:

A TQM promotes	1 Small change
B Kaizen is	2.Continuos improvement
C Quality circle can solve problem related to	3.Employee participation
D Quality circle benefit to	4.Employees

The correct order is

a. A-3, B-1, C-2, D-4

b. A-1, B-3, C-2, D-4

c. A-3, B-1, C-4, D-2

d. A-3, B-2, C-1, D-4

8. The term ―benchmarking‖ means:

(a) Comparing with past data from your organization

(b) Comparing with the results of a market survey

(c) Comparing with the results of a customer survey

(d) none of the above

9. The activity which includes confirming understanding, brainstorming and testing ideas is

(a) Code walkthrough

(b) Inspection

(c) Review

(d) Structured walkthrough

10. The following can be considered to measure quality:

(a) Customer satisfaction

(b) Defects

(c) Rework

(d) All the above

11. The objective of TQM is

(a) to improve process

(b) To improve profitability

(c) All of the above

(d) None of the above

12. The following is NOT a category in MBNQA criteria:

(a) Leadership

(b) HR Focus

(c) Quality management

(d)Information and Analysis

13. The statement of an organization's commitment to quality is

(a) Policy

(b) Vision

(c) Mission

(d) Principle

14. Which of the following is not a defect metric?

(a) Location

(b) Cause

(c). Time to fix

(d) All the above

15. The Quality manager will find it difficult to effectively implement the QAI Quality Improvement Process, unless his organization is willing to accept the Quality principles as :

(a)The organization‘s policy

(b)A challenge

(c)The corporate vision

(d)All the above

CHECK YOUR PROGRESS-B(TRUE/FALSE)

1. Baselines measure the situation prior to change.
2. There are five numbers of function types.
3. While setting Quality objective, Customer need to be considered.
4. Training & development helps organization increase employee turnover and absenteeism.

5. While setting Quality objective, customer need to be considered.
6. Lower level management is responsible for quality objective.
7. Total Quality Management (TQM) focuses on Employee and customer.
8. The process mapping is a work flow diagram.
9. CMM stands for Capability motivation model.
10. Standards, Quality control and procedures forms a part of a workbench.
11. System Test Plan will not include risks.
12. The focus on the product is highest during checkpoint review.

ANSWERS TO CHECK YOUR PROGRESS-A

1.a 2.c 3.a 4.d 5.a 6.a 7.a 8.d 9.c 10.d 11.a 12.c 13.a 14.d 15.d

ANSWERS TO CHECK YOUR PROGRESS-B

1 True 2 False 3 True 4 False 5 True 6 False 7 True 8. True 9.False 10 True 11 True 12 True

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6.15 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Expalin the TQM process in detail.

Q.No.2 Discuss the Seven C‘s of TQM.

Q.No.3 List and discuss the philosophy of quality gurus.

Q.No.4 Explain the principles of the TQM in detail.

UNIT -7

BALANCED SCORECARD, EVA & BACKFLUSH COSTING

Structure

7.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Meaning of Balanced Scorecard
- Perspectives of balanced scorecard
- Steps in development of a BSC
- Balance Scorecard Implementation
- Benefits and drawbacks of BSC
- Meaning of EVA
- Calculation of EVA

- Advantages of economic value added
- Meaning of Backflush Costing
- Conditions for adopting Backflush Costing
- Different Types of Backflush Costing
- Difficulties of Backflush Costing
- Back flushing in JIT system

7.2 Meaning of Balanced Scorecard (BSC)

The Balanced Scorecard (BSC) is a strategy performance measurement tool - a semi-standard structured report, supported by design methods and automation tools that can be used by managers to keep track of the execution of activities by the staff within their control and to monitor the consequences arising from these actions. Balanced Scorecard (BSC) is a new approach to Strategic Management which was developed by Robert Kaplan and David Norton. It is a performance management and strategy deployment methodology that helps executives translate an organization‟s mission statement and overall business strategy into specific, quantifiable goals and monitors the organization‟s performance in terms of these goals. The BSC also aligns budgets to strategy and helps in developing an enterprise performance management system.

According to Robert Kaplan and David Norton:

“The balanced scorecard retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation.”

In fact, Balanced Scorecard is a way “to translate strategy into action. Generally, it is used in two broad forms:

1. As individual scorecards that contain measures to manage performance, those scorecards may be operational or have a more strategic intent; and
2. As a Strategic Management System, as originally defined by Kaplan & Norton.

The critical characteristics that define a balanced scorecard are:

- its focus on the strategic agenda of the organization concerned
- the selection of a small number of data items to monitor
- A mix of financial and non-financial data items.

Objectives of Implementation of Balance Scorecard:

Implementing the Balanced Scorecard system company-wide should be the key to the successful realization of the strategic plan/vision. A Balanced Scorecard should result in:

- Improved processes
- Motivated/educated employees
- Enhanced information systems
- Monitored progress
- Greater customer satisfaction
- Increased financial usage

7.3 Four Perspectives of Balanced Scorecard:

Balanced scorecard useS a "4 perspective" approach to identify what measures to use to track the implementation of strategy. The following are the four perspectives of Balanced Scorecard:

1. **The Customer Perspective**

Customer Satisfaction is very much significant these days. Almost every business has realized the importance of customer focus and in any business. These are leading indicators. If customers are not satisfied, they will eventually find other suppliers that will meet their needs. Poor performance from this perspective is thus a leading indicator of future decline, even though the

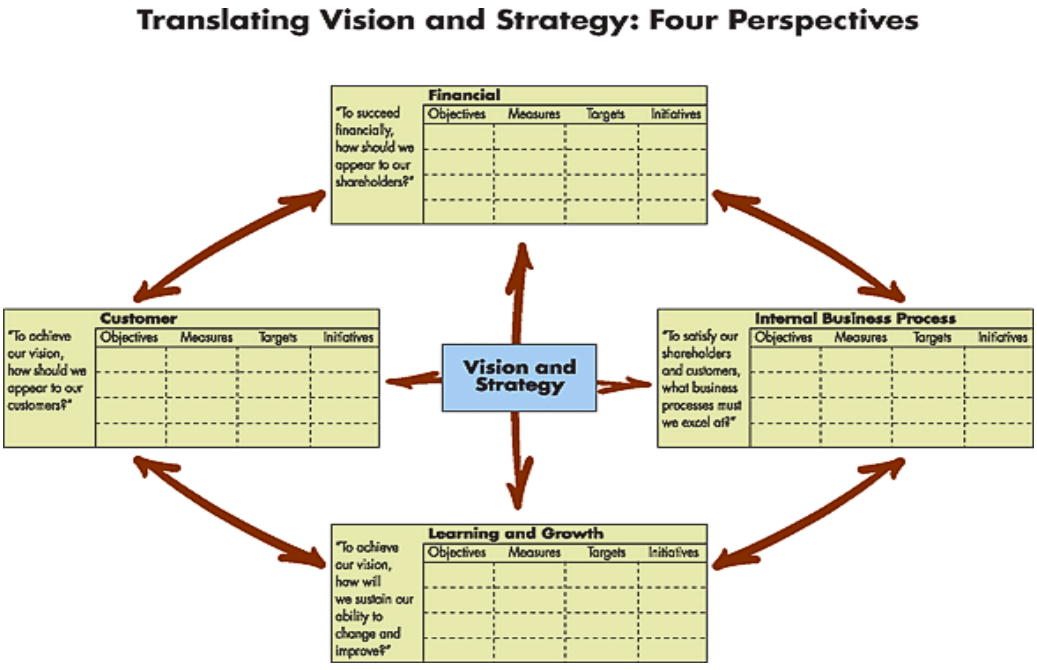
current financial picture may look good. In developing metrics for satisfaction, customers should be analyzed in terms of kinds of customers and the kinds of processes for which we are providing a product or service to those customer groups.

2. The Business Process Perspective

Business Process Perspective is related to internal business processes. Metrics based on this perspective allow the managers to know how well the business is running, and whether its products and services conform to customer requirements (the mission). These metrics have to be carefully designed by those who know these processes most intimately; with our unique missions these are not something that can be developed by outside consultants. In addition to the strategic management process, two kinds of business processes may be identified:

a) Mission-oriented processes, and
b) Support processes.

Mission-oriented processes are the special functions and many unique problems are encountered in these processes. The support processes are more repetitive in nature and hence easier to measure and benchmark using generic metrics.



3. The Learning and Growth Perspective

The Learning and Growth Perspective includes employee training and corporate cultural attitudes related to both individual and corporate self-improvement. In a knowledge-worker organization, people – the only repository of knowledge – are the main resource. In the current climate of rapid technological change, it is becoming necessary for knowledge workers to be in a continuous learning mode. Metrics can be put in place to guide managers in focusing training funds where they can help the most. In any case, learning and growth constitute the essential foundation for success of any knowledge-worker organization. The emerging realization is that "learning" is more than "training"; it also includes things like mentors and tutors within the organization, as well as that ease of communication among workers that allows them to readily get help on a problem when it is needed. It also includes technological tools like the Intranet.

4. The Financial Perspective

The Financial Perspective concentrates on the importance of financial data. Timely and accurate funding data will always be a priority, and managers will do whatever necessary to provide it. In fact, often there is more than enough handling and processing of financial data. With the implementation of a corporate database, it is hoped that more of the processing can be centralized and automated. But the point is that the current emphasis on financials leads to the "unbalanced" situation with regard to other perspectives.

Balanced Scorecard - Factors Examples

Department	**Areas**

Customer	Delivery performance to customer Quality performance for customer Customer satisfaction rate Customer percentage of market Customer retention rate
Internal Business Processes	Number of activities per function Duplicate activities across functions Process alignment (is the right process in the right department?) Process bottlenecks Process automation
Learning & Growth	Is there the correct level of expertise for the job? Employee turnover Job satisfaction

	Training/Learning opportunities
Finance	Quarterly sales growth and operating income by division Return On Investment Cash Flow Return on Capital Employed Financial Results (Quarterly/Yearly)

Shortcomings of the Balanced Scorecard

a) Community and Environmental Issues are missing. Today these are critical issues.

b) Competitors have not been included. Companies need to monitor the environment to track competitor activity and technological developments.

These criticisms mainly stem from the fact that the balanced scorecard is not a multiple stakeholder frame work. Any performance measurement frame work needs to reflect the needs of all the important stakeholders.

Summary :

To conclude, it may be remarked that various criticisms however, do not detract from the inherent merit of the balanced scorecard which helps to clarify, consolidate and gain consensus around the strategy of the organization. It is also a very powerful tool for strategy implementation. The points missed out may be added as additional perspectives to the original four.

7.6 What is 'Economic Value Added - EVA'

ECONOMIC VALUE ADDED: It is a tool of performance measurement, which estimates the firms economic profits or the created value in the excess of returns to shareholders interest. It calculates the financial position by deducting cost of capital from firms operating profits. EVA is an incremental difference between rate of return over companies cost of capital. it is said to be the paramount measure of the true profitability of an enterprise, and is attached to cash flow and not to earnings per share (EPS). EVA is a registered trademark of the US firm, Stern Stewart & Company. On the other hand, if the economic value added is negative it means that the cost of capital employed is greater than the profit generated by the company and this means a turn down

in the company's value over the period.

- It is a measure which is based on the remaining wealth that can be calculated by deducting its cost of capital from its operating profit, after making all adjustments for taxes on a cash basis. In simple words, we can say that EVA is an incremental difference between rate of return over companies cost of capital. EVA can also be named as economic profit, and that attempts to confine the true economic profit of a company.
- If a company's EVA is negative, it means the company is not generating value from the funds invested into the business. On the other hand, a positive EVA shows a company is producing value from the funds invested in it.
- It is an indicator to measure the financial performance. It takes into account the profit &loss, balance sheet efficiently and opportunity cost of capital.

EVA = Net Operating Profit after Taxes

(NOPAT) - Invested Capital * Weighted Average Cost of Capital (WACC)

FEATURES OF EVA:

EVA is an index to measure the financial performance. It takes into account the profit &loss, balance sheet efficiently and opportunity cost of capital. The principles of Economic Value Added are also comparatively simple to understand .The fact that the principles of EVA can be easily communicated to others, which include employees, gives them a common goal, so to focus towards the achievement of only this objective.While the theory of EVA and its application can be complex, the basic performance stands for appeal to common sense. EVA can also be used as a kind of diagnosed tool. EVA as a performance indicator is very useful. The calculation shows how and where a company created wealth, through the inclusion of balance sheet items. The following are the main features of Economic Value Added:

1. EVA is a management tool that helps the managers to take decisions by taking in mind the interest of shareholders.
2. EVA focuses on a firm‟s ability to pay shareholders expenditure.

3. Eva reporting use the market information and estimates the cost of capital, related firms, rate of returns etc.
4. Time value of money is recognized in EVA, reporting through the use of WACC . the weighted average cost of capital is based on the price value of interest \ dividend outflow
5. EVA is a management tool that helps the managers to take decisions by taking in mind the interest of shareholders.
6. EVA focuses on a firm‟s ability to pay shareholders expenditure.
7. EVA reporting uses the market information and estimates the cost of capital, related firms, rate of returns etc.
8. Time value of money is recognized in EVA, reporting through the use of WACC. the weighted average cost of capital is based on the price value of interest \ dividend outflow.

7.7 Calculation of EVA

The formula for calculating EVA is:

Net Operating Profit after Taxes (NOPAT) - Invested Capital * Weighted Average Cost of Capital (WACC)

The equation above shows there are three key components to a company's EVA:

- NOPAT, the amount of capital invested and the WACC. NOPAT can be calculated manually but is normally listed in a public company's financials.
- Capital invested is the amount of money used to fund a specific project.
- WACC is the average rate of return a company expects to pay its investors; the weights are derived as a fraction of each financial source in a company's capital structure.

The goal of EVA is to quantify the charge, or cost, for investing capital into a certain project, and then assess whether it is generating enough cash to be considered a good investment. The charge represents the minimum return that investors require to make their investment worthwhile.

Steps to Calculate Economic Value Added (EVA)

EVA or Economic Value Added is a financial measurement of how much value was created or destroyed for the reporting period. The following example illustrates a four step approach to

calculating EVA:

Step 1: Calculate NOPAT (Net Operating Profits after Taxes)

Gross Profits (Sales - Cost of Goods Sold) of Rs. 100,000 less Depreciation & Amortization of Rs.85,000 = Rs.15,000 less income taxes @ 30% = NOPAT of Rs. 10,500.

Step 2: Determine Amount of Capital Deployed

Net Working Capital of Rs. 20,000 + Net Fixed Assets of Rs. 60,000 = Total Capital Deployed of Rs. 80,000.

Step 3: Calculate Your Weighted Average Cost of Capital

We will assume that the Capital Asset Pricing Model was used for calculating an equity cost of capital of 14% and that market weights show 65% debt and 35% equity. Cost of Equity x Market Weights or .14 x .35 = .049. Cost of Debt x Market Weights or .09 x .65 = .0585. This gives us Weighted Average Cost of Capital of .1075 or 10.75% (.049 + .0585).

Step 4: Calculate Capital Charge to NOPAT & EVA

Total Capital Deployed (Step 2) was Rs. 80,000 x Weighted Average Cost of Capital (Step 3) of .1075 = Total Charge for Cost of Capital Rs. 8,600. Now take NOPAT (Step 1) which was Rs. 10,500 Less Charge for Cost of Capital of Rs. 8,600 = Economic Value Added or EVA of Rs. 1,900.

Example

Stark Industries' earnings before interest and taxes for the financial year 2015 amounted to Rs.5,130 million. Applicable tax rate is 35%. 60% of the company's assets are financed by debt which has an after tax cost of 3.8%, while 40% is financed by equity with a cost of 9.8%. Stark Industries average total capital employed over the period amounted to Rs.50,420 million. Find Stark Industries' economic value added.

Economic Value Added = NOPAT − WACC × Capital Employed

NOPAT = EBIT × (1 − Tax Rate) = Rs.5,130 million × (1 − 35%) = Rs.3,334 million

WACC = 0.6 × 3.8% + 0.4 × 9.8% = 6.2%

Economic Value Added = Rs.3,334 million − 6.2% × Rs.50,420 = Rs.208 million

This tells us that over the financial year 2015, Stark Industries added a total of Rs.208 million to

its value.

7.8 Advantages of EVA:

The principles of Economic Value Added are comparatively simple to understand.The fact that the principles of EVA can be easily communicated to others, which include employees gives them a common goal, so to focus towards the achievement of only this objective.While the theory of EVA and its application can be complex, the basic performance stands for appeal to common sense. EVA can also be used as a kind of diagnosed tool. The following are the main advantages/benefits of Economic Value Added:

- Measures the business performance: Economic value added is used to measure the business performance of a company.
- Management decisions: EVA helps to take major decisions in the organization.
- Identification of best person: It also helps the owners of the company to find the best person to work in the company effectively and efficiently.
- With the help of EVA, company can evaluate the projects independently and decide to execute various projects.
- It is an efficient method to communicate with outsiders, other investors.
- It converts the accounting data into economic quality which can be easily used by non financial managers.
- EVA is a step towards the efficiency.
- A great advantage of EVA is that it is universally applicable. So that the comparison and analysis can be done.
- It is influenced by all of the decisions that managers have to make within a firm - the investment decisions and dividend decisions and the financing decision affects the cost of capital.
- EVA is directly related to NPV. The corporate finance theory states that the value of the firm will increase with positive NPV projects.
- It avoids the problems associates with approaches that focus on percentage spreads - between ROE and Cost of Equity and ROC and Cost of Capital. These approaches may lead firms with high ROE and ROC to turn away good projects to avoid lowering their percentage spreads.
- It makes top managers responsible for a measure that they have more control over - the

return on capital and the cost of capital are affected by their decisions - rather than one that they feel they cannot control either - the market price per share.

EVA and Market Value Added

The relationship between EVA and Market Value Added is more complicated than the one between EVA and firm value. The market value of a firm reflects not only the Expected EVA of assets in place but also the expected EVA from future projects To the extent that the actual economic value added is smaller than the expected EVA the market value can decrease even though the EVA is higher.

7.9 Summary:

It may be concluded that EVA forces managers to be aware of assets and expenses when making managerial decisions. However, the EVA calculation relies heavily on the amount of invested capital, and is best used for asset-rich companies that are stable or mature. Companies with intangible assets, such as technology businesses, may not be good candidates for an EVA evaluation. In the traditional budgeted and standard costing systems, the timing of entries recorded in the cost accounting system is synchronized with the timing of purchase of materials, issue of materials for production, wages and overheads incurred and charged to work in progress, completion of the finished goods and sale of the finished goods. Sequential tracking of entries with the passage of the products from direct materials, through work in progress, to finished goods and finally sale of the finished goods, is expansion because it involves recording of many entries in the books of accounts. An alternative to this approach of sequential tracking of cost accounting system is to delay, the recording of journal entries until after the physical sequences have occurred is known as backflush costing. An extreme form of delay to record the journal entries is to wait until sale of a finished product takes place.

7.10 BACKFLUSH COSTING:

Backflush coating is a simpler cost accounting system designed to reflect JIT (Just in Time) production systems. According to Horngren, Foster and Datar, “The term backflush costing (also called delayed costing, end point costing or post- deduct costing) describes a costing system that delays recording changes in a product being produced until good finished units appear; it then uses budgeted or standard costs to work backward to assign manufacturing costs to units

produced. Typically no record of work in process appears in the accounting system. Backflush costing accompanies JIT production systems, although backflush can be coupled with any production system. The term backflush probably arose because the trigger point for inventory costing entries can be delayed until as late as the time of sole. Costs are then finally flushed back through the accounting system.

CIMA- CIMA defines it as "cost accounting system, which focuses on the output of an organization and then works back to attribute costs to stock and cost of sales."

According to Ravi M. Kishore:

"Backflush costing is a cost accounting system which focuses on the output of the organization and then work backwards to allocate costs between cost of goods sold and inventory".

Backflush costing eliminates need for a separate work in process account. There are two basic justifications for the system:

i. To remove the incentive for managers to produce for inventory.
ii. To increase focus of the managers on plant wide goal than on individual sub unit goals.

7.11 Conditions for adopting Backflush Costing

Companies which adopt backflush costing should meet the following three conditions:

1. Detailed tracking of actual cost of direct material purchased or actual cost of conversion incurred through a series of operations, step by step to the point of completion is not thought to be necessary by the management. In other words, management wants a simple accounting system.
2. For each product budgeted or standard costs have been set.
3. Backflush Costing yields approximately the same financial results as traditional budgeted and standard costing systems which give follow sequential tracking of entries with the physical sequence tracking of entries with the physical sequences of purchases, production, and sale of goods.

7.12 Difficulties of Backflush Costing

Backflush costing does not follow strictly the generally accepted accounting principles of external reporting. For example. Work-in-progress as an asset exists but is not recognized in backflush costing system of accounting. According to Hermann. Fume-J Datar, "Advocates of back flushing, however, cite the materiality concept in support if these versions of backflush accounting. They claim that if inventories are low or not subject to significant change from one accounting period to the next, operating income and inventory costs developed in a backflush costing system will not differ materially from the results generated by a system that does adhere to generally accepted accounting principles.

Backflush costing does not provide as much information as the traditional systems of accounting provide.It becomes difficult to audit the transactions because of absence of audit trails on account of not following sequential recording of transactions.

7.13 BACKFLUSHING IN JIT SYSTEM

Back flushing required no data entry of any kind until a finished product is completed at that time total amount of information of finished product is entered in to the computer. Information is also based on bill of material, which shows list of components that should have been used in the production process. This is subtracted from the opening inventory balance to arriving at the closing stock. Back flushing is good because data entry occurs one in the entire production process.

However there are some serious limitations of back flushing that must be corrected before it will work properly;

1. Production reporting: The total production quantity entered must be correct. If not, then wrong components & qty will be subtracted from stock.
2. Scrap Reporting: All abnormal scrap must be diligently track and recorded otherwise these will fall outside back flushing system and will not charge to it.
3. Lot Tracing : Lot tracing is very difficult in back flushing system , it is required when a manufacturer need to keep records of which production lots were used to create a product

in case all items in a lot must be recalled.

4. Inventory Accuracy: It become difficult to know accurately the inventory balance as in a back flushing system, data is feed into the system only once a day this makes a difficult to maintain an accurate set of inventory records in the warehouse. Given below are the main points of backflush costing which is used under JIT System
    - There is no department in JIT. There are only cells & stations.
    - A 14-Days lead time is reduced to hours, and it will be absurd to trace costs from station to station.
    - Production cycle is in minutes & hours.
    - Goods are shipped immediately upon completion.
    - Then all of each day,,s cost flows to cost of goods sold.

Back flushing costing eliminates separate raw materials and work-in –process account. There is a single RIP. The RIP Account is used only for tracking of the cost of raw materials. Under JIT system, Materials are immediately placed into process. For this reason, there is no need to record it under separate inventory account. Combining direct labor and overhead into one category is a second feature of backflush costing. As firms implement JIT and automate, traditional direct labor category disappears. Multiskilled workers intermingle set up activities, maintenance and material handling etc. As labor becomes multifunctional, the ability to track and report direct labor costs with overhead costs in a temporary account called conversion costs control. This account accumulates the actual conversion cost on debit side and applied conversion cost on the credit side.

KEYWORDS

1. **Balanced Scorecard** – An approach that incorporates financial and nonfinancial measures in an integrated system that links performance measurement and a company‟s strategic goals.
2. **Customer perspective** – A viewpoint employed in the balanced scorecard to evaluate the company from the perspective of those people who buy and use its products or services.
3. **Financial perspective** – A viewpoint employed in the balanced scorecard to evaluate a company‟s performance using financial measures.
4. **Ideal standards** – Standards based on the optimum level of performance under perfect

operating conditions.

5. **Internal process perspective** – A viewpoint employed in the balanced scorecard to evaluate the effectiveness and efficiency of a company‟s value chain, including product development, production, delivery, and after-sale service.
6. **Learning and growth perspective** – A viewpoint employed in the balanced scorecard to evaluate how well a company develops and retains its employees.
7. **Normal capacity** – The average activity output that a company should experience over the long run.
8. **Economic value added (EVA)** is an internal management performance measure that compares net operating profit to total cost of capital.
9. Backflush costing -An accounting method that flows product and production costs to cost of goods sold accounts during an accounting period and that back flushes those costs to raw material and finished goods accounts for products not sold at the close of the accounting period.

7.15 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1. Balanced scorecard perspective measures company's success in targeted segments of customers, this perspective can also be classified as

   a) internal business process perspective
   b) customer perspective
   c) learning perspective
   d) financial perspective

2. In order to get the most out of the Balanced Scorecard, it should not be thought of as a:

a) Stand alone performance measurement program
b) Framework for communicating and executing strategy
c) Tool for shifting emphasis from short term thinking to strategic thinking.
d) Strategic management system

3. The very bottom perspective of the Balanced Scorecard is the ultimate "enabler" for the three

top layers. This bottom perspective is called:

a) Internal Processes
b) Market Share
c) Learning & Growth
d) Shareholder Value

4. Which of the following goals relates to the strategic area of Efficient and Seamless Delivery Systems?

a) We will grow revenues by 20% each year over the next four years.
b) We will expand our customer share in the marketplace by 10% over the next three years.
c) We will attract the best and brightest people by adopting an entrepreneurial culture.
d) We will improve production delivery times by 30% over the next two years

5 The measurement, % of market share, would most likely be placed in which perspective of the Balanced Scorecard?

a) Financial
b) Customer
c) Product Innovation
d) Learning & Growth

6 The description of how different levels and employees in the organization must perform for the organization to achieve the organizational goals is:

a) business level strategy
b) Mission statement
c) Balance scorecard
d) None of the above

7 An example of learning and growth perspective in balanced scorecard is

a) employee turnover rates
b) operating capabilities and number of patents

c) operating income and revenue growth
d) customer satisfaction and market share

8. In an innovation process, operation process and post sales services are all sub processes of a perspective named:

a) internal business process perspective
b) external business process perspective
c) leadership perspective
d) reengineering perspective

9. Balanced scorecard perspective, which measures strategy profitability and amount of operating income results from cost reduction is classified as:

a) learning perspective
b) financial perspective
c) internal business process perspective
d) customer perspective

10. Economic value added provides a measure of

a. How much value is added by the economy
b. How much value is added by operations
c. How much a business affects the economy
d. How much wealth a company is creating compared to its cost of capital

11. What is the difference between economic profit and accounting profit?

a. Economic profit includes a charge for all providers of capital while accounting profit includes only a charge for debt.
b. Economic profit covers the profit over the life of the firm, while accounting profit only covers the most recent accounting period
c. Accounting profit is based on current accepted accounting rules while economic profit is based on cash flow.

d. All of the above

12. What is the formula to calculate economic value added?

a. Net profit – WACC

b. Revenue - (capital invested * WACC)

c. Net profit, after tax - WACC

d. Net profit, after tax - (capital invested * WACC)

13 If you have net profit of Rs.100,000, invested capital of Rs.50,000 and WACC of 10%, what is your economic value added?

a. Rs.50,000

b. Rs.40,000

c. Rs.10,000

d. Rs.95,000

CHECK YOUR PROGRESS-A(TRUE/FALSE)

1. Backflush costing is a simpler cost accounting system designed to reflect JIT production system.
2. The another name of backflush costing is endpoint costing.
3. Backflush costing is a cost accounting system which focuses on the output of the organization and then works forward to allocate costs between cost of goods sold and inventory.
4. The main condition for adopting backflush costing is that for each product standard cost must have been set.
5. Back flushing required no data entry of any kind until a finished product is completed.

ANSWERS TO CHECK YOUR PROGRESS-A

1. b 2.a 3. C 4. D 5. B 6.c 7.a 8.a 9.b 10.d 11. A 12.d 13.d

ANSWERS TO CHECK YOUR PROGRESS-B

1 True, 2 True, 3 False, 4 True, 5 True

7.16 REFERENCES

1. Kishore, Ravi. “Advanced Cost Accounting and Cost Systems,” Taxmann Publications Private Limited.

2. Pasricha A.S and Vashist A.K. “Cost Accounting ”, Unistar Publications .

3. Horngren ,Charles T. and Datar ,Srikant M., “Cost Accounting: A Managerial Emphasis”

4. Saxena V.K and Vashist C.D “Cost Management,” Sultan Chand and Sons Publications.

7.17 TERMINAL AND MODEL QUESTIONS:

Q.No.1 What are the four perspectives of the balanced scorecard (BSC)?

Q.No.2 When Kaplan and Norton say the BSC is a strategic system, do they mean as a way to formulate strategy or implement strategy?

Q.No.3 Most organizations tend to have good strategic plans, but they fail to successfully implement their strategic plans. Identify at least two reasons why organizations fail to implement their strategic plans?

Q.No 4 What is the ultimate goal behind full-scale implementation of the Balanced Scorecard?

Q.No.5 Briefly describes the “strategic foundation” for building the Balanced Scorecard?

Q.No.6 Explain in detail the concept of EVA.

Q.No.7 Economic value added (EVA) concept is in conformity with the objective of wealth maximization. Explain?

Q.No.8 “Discounted cash flow is very close to economic value added”. Explain.

Q.No.9 What are the steps to calculate EVA? Also explain its advantages in detail.

Q.No.10 Why are the companies in private sector, as well as state owned enterprises, turning to economic profit as a measure of performance, and what has been the catalyst?

Q.No.11 What do you mean by backflush costing? What are the conditions for adopting backflush costing?

Q.No.12 Explain the different types of backflush costing along with the entries to be recorded under each type of backflush costing?

Q.No14 Write Short Notes on:
(a) Backflush costing
(b) Backflushing in JIT system?
(c) Concept of EVA.

UNIT-8

BASIC KNOWLEDGE OF COST ACCOUNTING RECORD RULES

STRUCTURE

8.1 LEARNING OBJECTIVES

Learning Objectives

COMPANIES (COST RECORDS AND AUDIT) RULES, 2014 Cost Record Rules

Cost Audit Report-Part A

Part-B(For Manufacturing sector)

Part-C(For service Sector)

Part-D(Product and Services Learning Objectives

8.2 COMPANIES (COST RECORDS AND AUDIT) RULES, 2014Cost Record Rules

Cost Audit Report-Part A

Part-B(For Manufacturing sector)

Part-C(For service Sector)

Part-D(Product and Services Profitability Statement)

After studying this chapter you should be able to understand:

Cost Record Rules

8.2 COMPANIES (COST RECORDS AND AUDIT) RULES, 2014

The Companies Act, 2013 empowers the Central Government to make the rules in the area of maintenance of cost records by the companies engaged in the specified industries, manufacturing providing such goods / services; and for getting such cost records audited, vide Section 148.

Thus, it is the "subordinate legislative power" of the Central Government, to make rules for maintenance of cost records and audit thereof in respect of specific industries. Accordingly, the Central Government made, from time to time, several notifications / orders, ever since the provisions were made in the erstwhile Companies Act, 1956, as well as under the current Act of 2013.

The Following are the Rules Which Cover the Major Points Related to Cost Audit records :-

Rule -1 -These rules may be called Companies (Cost Records and Audit rules ,2014. These shall be come into Force on the date of Publication in the Official Gazette i.e. 30.06.2014.

Rule -2- In these rules, defined various points -

(a) Act; Central Excise Tariff Act Heading; **(b)** Cost Accountant in practice; **(c)** cost auditor **(d)** cost audit report; **(e)** cost records; **(f)** form; **(g)** institute; **(h)** all other words and expressions used in these rules but not defined, and defined in the Act or in the Companies (Specification of Definition Details) Rules,2014.

Rule-3: Application of Cost Records :

Two categories (regulated sectors and non-regulated sectors) have been retained and a general threshold of turnover of ` 35 crores or more has been prescribed for companies covered. Micro enterprise or a small enterprise as per MSMED Act, 2006 have been taken out of the purview.

Rule-4: Applicability for Cost Audit:

Even for regulated sectors like Telecommunication, Electricity, Petroleum and Gas, Drugs and Pharma, Fertilizers and Sugar, Cost audit requirement has been made subject to a turnover based threshold of 50 crores for all product and services and 25 crores for

individual product or services. For Non-regulated sector the threshold is 100 crores and 35 crores respectively.

Rule-5: Maintenance of Cost Records:

The requirement to maintain cost records in Form CRA-1 have been postponed to Financial Year 2015-16 for the following companies in some non-regulated sectors, namely; Coffee and Tea, Milk Powder and Electricals and electronic machinery.

Rule-6: Cost Audit:

Any casual vacancy in the office of a cost auditor, whether due to resignation, death or removal to be filled by the Board of Directors within thirty days of occurrence of such vacancy and the company shall inform the Central Government in Form CRA-2 within thirty days of such appointment of cost auditor.

The Following are the Various Forms to Maintain Cost Audit Records in the Company :-

CRA-1: Forms in which cost records shall be maintained

The form CRA-1 prescribes the form in which cost records shall be maintained. The form categorises the requirement of maintaining proper details as per 30 headings. The headings are as follows:

(1) Material Cost,

(2) Employee Cost,

(3) Utilities,

(4) Direct Expenses,

(5) Repair and Maintenance,

(6) Fixed Assets and Depreciation,

(7) Overheads

(8) Administrative Overheads,

(9) Transportation Cost,

(10) Royalty and Technical Know-how,

(11) Research and Development expenses,

(12) Quality Control Expenses,

(13) Pollution Control Expenses,

(14) Service Department Expenses,

(15) Packing Expenses,

(16) Interest and Financing Charges,

(17) Any other item of Cost,

(18) Capacity Determination,

(19) Work- in-progress and finished stock,

(20) Captive Consumption,

(21) By- Products and Joint Products,

(22) Adjustment of Cost Variances,

(23) Reconciliation of Cost and Financial Accounts,

(24) Related Party Transactions,

(25) Expenses or Incentives on Exports,

(26) Production records,

(27) Sales records,

(28) Cost Statements,

(29) Statistical Records,

(30) Records of Physical Verification.

CRA-2: Form of intimation of appointment of cost auditor by the company to **Central Government**

(1) Corporate Identity number (CIN) or foreign company registration number (FCRN) of the company

(2) General Information

(3) Product**(s)**/Service**(s)** to which Cost Audit relates

(4) Details of all the Cost Auditor**(s)** appointed

(5) Financial year to be covered under the Cost Audit

(6) Details of previous Cost Auditor which has not been reappointed

(7) Copy of the Board resolution of the company optional attachment - if any.

CRA-3: Form of Cost Audit Report

Clauses (vii) have been added to auditor's report as under:
Detailed unit-wise and product/service-wise cost statements and schedules thereto In respect of the product/services under reference of the company duly audited and certified by me/us are/are not kept in the company.

CRA – 4: Form for filing Cost Audit Report with the **Central Government**

(1) Corporate identity number (CIN) or foreign company Registration number (FCRN) of the company

(2) General Information

(3) Corporate identity number (CIN) or foreign company Registration number (FCRN) of the company

(4) Details of Industries/Sectors/Product**(s)**/Service**(s)** (CETA headling level, wherever applicable as per Rules for Regulated and Non-regulated sector) for which the Cost Audit Report is being submitted

(5) Details of Industries/Sectors/Product**(s)**/Service**(s)** (CETA headling level, wherever applicable as per Rules for Regulated and Non-regulated sector) not covered in the Cost Audit Report

(6) Details of the cost auditor**(s)** appointed

(7) Details of observation of the Cost Audit report

(8) Attachment-XBRL document in respect of the cost audit report and Company's information and explanation on every Qualification and reservation contained therein optional attachment if any.

Detailed Rule as per pronouncement by the MCA, GOI is reproduce for reference:-

The Companies (Cost Records and Audit) Rules, 2014 came into force on 30th June, 2014. These rules were amended on 31st December' 2014 giving effect to Rule 2, 3, 4, 5, 6, 7 and Form CRA 1 & CRA 3. It was further amended on 12th June'2015 to giving effect on Form CRA 2 & CRA 4. Further amendment was made on 14th July 2016**.**

Represented here under the existing provisions as applicable, after considering amendments till date, as mentioned above:

1. Short title and commencement

(1) These rules may be called the Companies (cost records and audit) Rules, 2014.

(2) They shall come into force from the date of their publication in the Official Gazette.

2. Definitions: In these rules, unless the context otherwise requires -

(a) "Act" means the Companies Act, 2013 (18 of 2013);

(aa) "Central Excise Tariff Act Heading" means the heading as referred to in the Additional Notes in the First Schedule to the Central Excise Tariff Act, 1985 [5 of 1986];

(b) "Cost Accountant in practice" means a cost accountant as defined in clause **(b)** of sub- section (1) of section 2 of the Cost and Works Accountants Act, 1959 (23 of 1959), who holds a valid certificate of practice under sub-section (1) of section 6 of that Act and who is deemed to be in practice under sub-section (2) of section 2 thereof, and includes a firm or limited liability partnership of cost accountants;

(c) "cost auditor" means a Cost Accountant in practice, as defined in clause **(b)**, who is appointed by the Board;

(d) "cost audit report" means the duly signed cost auditor's report on the cost records examined and cost statements which are prepared as per these rules, including attachment, annexure, qualifications or observations attached with or included in

such report

(e) "cost records" means books of account relating to utilisation of materials, labour and other items of cost as applicable to the production of goods or provision of services as provided in section 148 of the Act and these rules;

(f) "form" means a form annexed to these rules;

(g) "institute" means the Institute of Cost Accountants of India constituted under the Cost and Works Accountants Act, 1959 (23 of 1959);

(h) all other words and expressions used in these rules but not defined, and defined in the Act or in the Companies (Specification of Definition Details) Rules, 2014 shall have the same meanings as assigned to them in the Act or in the said rules.

3. Application of Cost Records

For the purposes of sub-section (1) of Section 148 of the Act, the class of companies, including foreign companies defined in clause (42) of Section 2 of the Act, engaged in the production of the goods or providing services, specified in the Table below, having an overall turnover from all its products and services of rupees thirty five crore or more during the immediately preceding financial year, shall include cost records for such products or services in their books of account, namely:-

TABLE

(A) Regulated Sectors

Sl. No	**Industry/ Sector/ Product/ Service**	**Central Excise Tariff Act Heading (wherever applicable)**

1	Telecom Regulatory Authority of India under the Telecom Regulatory Authority of India Act, 1997 (24 of 1997); including activities that requires authorization or license issued by the Department of Telecommunications, Government of India under Indian	Not applicable.
2	Generation, transmission, distribution and supply of electricity regulated by the relevant regulatory body or authority under the Electricity Act, 2003 (36 of 2003);	Generation- 2716; Other Activity- Not Applicable
3	Petroleum products	2709 to 2715;
4	Drugs and pharmaceuticals;	2901 to 2942; 3001 to
5	Fertilizers;	3102 to 3105
6	Sugar and industrial alcohol	1701; 1703; 2207.

(B) Non-regulated Sectors

Sl No	**Industry/ Sector/ Product/ Service**	**CETA Heading (wherever**
1	Machinery and mechanical appliances used in defense,space and atomic energy sectors excluding	8401; 8801 to 8805; 8901 to8908.
2	Turbo jets and turbo propellers;	8411
3	Arms and ammunitions and Explosives	3601 to 3603; 9301 to 9306
4	Propellant powders.	3601 to 3603
5	Radar apparatus, radio navigational aid apparatus and radio remote control apparatus;	8526
6	Tanks and other armoured fighting vehicles, motorised, whether or not fitted with weapons and parts of such vehicles, that are funded (investment	8710

9	**Iron and Steel**	7201 to 7229; 7301 to 7326
10	Rubber and allied products being regulated by the Rubber Board constituted under the Rubber Act, 1947 (XXIV of 1947).	4001 to 4017
11	Coffee and tea;	0901 to 0902
12	Railway or tramway locomotives, rolling stock, railway or tramway fixtures and fittings, mechanical (including electro mechanical) traffic signaling	8601 to 8608.
13	Cement;	2523; 6811 to 6812
14	Ores and Mineral products;	2502 to 2522; 2524 to
15	Mineral fuels (other than Petroleum), mineral oils	2701 to 2708
16	Base metals;	7401 to 7403
17	Inorganic chemicals, organic or inorganic compounds of precious metals, rare-earth metals of radioactive elements or isotopes, and Organic	2801 to 2853; 2901 to 2942; 3801 to 3807; 3402 to
18	Jute and Jute Products	5303, 5310
19	Edible Oil;	1507 to 1518
20	Milk powder;	0402
21	Insecticides;	3808
22	Plastics and polymers;	3901 to 3914; 3916 to
23	Tyres and tubes;	4011 to 4013
24	Paper;	4801 to 4802
25	Textiles;	5004 to 5007; 5106 to 5113;
26	Glass;	7003 to 7008; 7011;
27	Other machinery;	8402 to 8487
28	Electricals or electronic machinery;	8501 to 8507; 8511 to 8512;

4. Applicability for Cost Audit

(1) Every company specified in item (A) of rule 3 shall get its cost records audited in accordance with these rules if the overall annual turnover of the company from all its products and services during the immediately preceding financial year is rupees fifty crore or more and the aggregate turnover of the individual product or products or service or services for which cost records are required to be maintained under rule 3 is rupees twenty five crore or more.

(2) Every company specified in item (B) of rule 3 shall get its cost records audited in accordance with these rules if the overall annual turnover of the company from all its products and services during the immediately preceding financial year is rupees one hundred crore or more and the aggregate turnover of the individual product or products or service or services for which cost records are required to be maintained under rule 3 is rupees thirty five crore or more.

(3) The requirement for cost audit under these rules shall not apply to a company which is covered in rule 3; and

(i) whose revenue from exports, in foreign exchange, exceeds seventy five per cent of its total revenue; or

(ii) which is operating from a special economic zone;

(iii) which is engaged in generation of electricity for captive consumption through Captive Generating Plant. For this purpose, the term "Captive Generating Plant" shall have the same meaning as assigned in rule 3 of the Electricity Rules, 2005"

5. Maintenance of records

(1) Every company under these rules including all units and branches thereof, shall, in respect of each of its financial year commencing on or after the 1st day of April, 2014, maintain cost records in **form CRA-1**.

Provided that in case of company covered in serial number 12 and serial numbers 24 to 32 of item (B) of rule 3, the requirement under this rule shall apply in respect of

each of its financial year commencing on or after 1st day of April, 2015.

(2) The cost records referred to in sub-rule (1) shall be maintained on regular basis in such manner as to facilitate calculation of per unit cost of production or cost of operations, cost of sales and margin for each of its products and activities for every financial year on monthly or quarterly or half-yearly or annual basis.

(3) The cost records shall be maintained in such manner so as to enable the company to exercise, as far as possible, control over the various operations and costs to achieve optimum economies in utilisation of resources and these records shall also provide necessary data which is required to be furnished under these rules.

6. Cost Audit

(1) The category of companies specified in rule 3 and the thresholds limits laid down in rule 4, shall within one hundred and eighty days of the commencement of every financial year, appointa cost auditor.

Provided that before such appointment is made, the written consent of the cost auditor to such appointment, and a certificate from him or it,as provided in sub-rule (1A), shall be obtained

(1A) The cost auditor appointed under sub-rule (1) shall submit a certificate that—

(a) the individual or the firm, as the case may be, is eligible for appointment and is not disqualified for appointment under the Act, the Cost and Works Accountants Act, 1959(23 of 1959) and the rules or regulations made thereunder

8.3 Annexure to cost audit report –PART –A

1	Corporate identity number or foreign company	
2	Name of company	

3	Address of registered office or of principal place of	
4	Address of corporate office of company	
5	Email address of company	
6	Date of beginning of reporting financial year	
7	Date of end of reporting financial year	
8	Date of beginning of previous financial year	
9	Date of end of previous financial year	
10	Level of rounding used in cost statements	
11	Reporting currency of entity	
12	Number of cost auditors for reporting period	
13	Date of board of directors meeting in which annexure to	
14	Whether cost auditors report has been qualified or has	
15	Consolidated qualifications, reservations or adverse	
16	Consolidated observations or suggestions of all cost	
17	Whether company has related party transactions for sale	

1. General Details of Cost Auditor

1	Whether cost auditor is lead auditor	
2	Category of cost auditor	
3	Firm's registration number	
4	Name of cost auditor/cost auditor's firm	
5	PAN of cost auditor/cost auditor's firm	
6	Address of cost auditor or cost auditor's firm	
7	Email id of cost auditor or cost auditor's firm	
8	Membership number of member signing report	
9	Name of member signing report	
10	Name(s) of product(s) or service(s) with CETA heading	
11	SRN number of Form 23C / CRA-2	
12	Number of audit committee meeting attended by cost auditor	
13	Date of signing cost audit report and annexure by cost auditor	
14	Place of signing cost audit report and annexure by cost auditor	

2. Cost Accounting Policy

(1) Briefly describe the cost accounting policy adopted by the Company and its adequacy or otherwise to determine correctly the cost of production/operation, cost of sales, sales realization and margin of the product(s)/service(s) under reference separately for each product(s)/ service(s). The policy shall cover, inter alia, the followingareas:

(a) Identification of cost centres/cost objects and cost drivers.

(b) Accounting for material cost including packing materials, stores and spares, employee cost, utilities and other relevant cost components.

(c) Accounting, allocation and absorption of overheads.

(d) Accounting for depreciation/amortization.

(e) Accounting for by-products/joint-products or services, scarps, wastage etc.

(f) Basis for Inventory Valuation.

(g) Methodology for valuation of Inter-Unit/Inter Company and Related Party

(2) Briefly specify the changes, if any, made in the cost accounting policy for the product(s)/ service(s) under audit during the current financial year as compared to the previous financial year.

(3) Observations of the Cost Auditor regarding adequacy or otherwise of the Budgetary Control System, if any, followed by the company.

3. PRODUCT/SERVICE DETAILS (for the company as a whole)

Name of Product(s) /Services)	**UOM**	**CETA heading (whereve**	**Covered under Cost Audit**	**Net Operational Revenue (net**	
				Curre nt	**Previo us**
1.					
2.					
3.					
4.					
……					
Total net revenue from opera- tions					
Other Incomes of company					
Total revenue as per financial accounts					
Extra ordinary income, if					
Total revenue including extra ordinary income,					
Turnover as per Excise/Service Tax					

Note: Explain the difference, if any, between Turnover as per Annual Accounts and Turnover as per Excise/Service Tax Records

8.4 PART-B

For Manufacturing Sector

1. QUANTITATIVE INFORMATION (for each product with CETA heading			
Name of Product			
CETA heading			
Particulars	Unit	Curre	Previo
1. Available Capacity			
(a) Installed Capacity			
(b) Capacity enhanced during the year, if any			
(c) Capacity available through leasing arrangements, if			
(d) Capacity available through loan license / third parties			
(e) Total available Capacity			
2. Actual Production			
(a) Self manufactured			
(b) Produced under leasing arrangements			
(c) Produced on loan license / by third parties on job			
(d) Total Production			
3. Production as per Excise Records			
4. Capacity Utilization (in-house) %			
5. Finished Goods Purchased			
(a) Domestic Purchase of Finished Goods			
(b) Imports of Finished Goods			
(c) Total Finished Goods Purchased			
6. Stock and Other Adjustments			
(a) Change in Stock of Finished Goods			
(b) Self/Captive Consumption (incl. samples etc.)			
(c) Other Quantitative Adjustments, if any (wastage etc.)			
(d) Total Adjustments			
7. Total Available Quantity for Sale [2(d) +5(c) + 6(d)]			
8. Actual Sales			
(a) Domestic Sales of Product			
(b) Domestic Sales of Traded Product			
(c) Export Sale of Product			
(d) Export Sale of Traded Product			
(e) Total Quantity Sold			

2. ABRIDGED COST STATEMENT (for each product with CETA heading							
	Name of Product						
	CETA heading						
	Unit of Measure						
		Producti	Finished Goods	Finished Stock	Captive Con-	Other Adjustme	Quan - tity
	Current						
	Previous						

Sl	Particulars	Current Year		Previous	
		Amou	Rate per	Amou	Rate per
1 2 3 4 5 6 7 8 9	Materials Consumed (specify details as per Para 2A) Process Materials/chemicals Utilities (specify details as per Para 2B) Direct Employees Cost Direct Expenses Consumable Stores and Spares Repairs and Maintenance Quality Control Expenses Research and Development				
14 15 16	Total (1 to 13) Increase/Decrease in Work-in-Progress Less: Credits for Recoveries, if any Primary				
18	Cost of Production/Operations (14 + 15				
19	Cost of Finished Goods Purchased				

20	**Total Cost of Production and Purchases (18 +19)**				
21	Increase/Decrease in Stock of Finished Goods				
22					
23	Less: Self/Captive Consumption (incl.				
24	**Cost of Production/Operation of Product Sold (20 + 21 to 23)**				
25	Administrative Overheads Secondary				
28	**Cost of Sales before Interest (24 to 27)**				
29	Interest and Financing Charges				
30	**Cost of sales (28 + 29)**				
31	**Net sales Realization (net of Taxes and**				
32	**Margin [Profit/(Loss) as per Cost Accounts]**				

2A. Details of Materials Consumed

Name of Product									
CETA heading									
Sl. N	**Description of Material**	**Cat-egory**	**UOM**	**Current Year**			**Previous Year**		
				Qty.	**Rate per**	**Amt.**	**Qty.**	**Rate per**	**Amt.**
1									
2									
3									
4									
5									
6.									

Category: Indigenous/ Imported/ Self Manufactured

2B. Details of Utilities Consumed

Name of Product								
CETA heading								
Sl. No.	Description of Material	UOM	Current Year			Previous Year		
			Quan	Rate	Amoun	Quan	Rate	Amoun
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

2C. Details of Industry Specific Operating Expenses

Name of Product			
CETA heading			
Sl. No	Description of Industry Specific Operating Expenses	Current Amount	Previous Amount
1.			
2.			
3.			
4.			
5.			

8.5 PART-C

For Service Sector

1. QUANTITATIVE INFORMATION (for each service separately)			
Name of Service			
Service Code (if applicable)			
Particulars	**Unit of Mea-**	**Current**	**Previous Year**
1. Available Capacity			
(a) Installed Capacity			
(b) Capacity enhanced during the year, if			
(c) Total available Capacity			
2. Actual Services Provided			
(a) Own Services			
(b) Services under contractual			
(c) Outsourced Services			
(d) Total Services			
3. Total Services provided as per Service Tax Records			
4. Capacity Utilization (in-house) %			
5. Actual Sales			
(a) Services rendered - Domestic			
(b) Services rendered - Export			
(c) Total Services Rendered			

2. ABRIDGED COST STATEMENT (for each service separately)							
Name of Service							
Service Code (if applicable)							
Unit of Measure							
		Service s	**Captive Consum**	**Other Adjustme**		**Servic es ren-**	
	Current Year						
	Previous Year						
Sl. No.	**Particulars**		**Current Year**		**Previous**		
			Amou nt	**Rate per**	**Amou**	**Rate per**	
1 2 3 4 5 6 7 8	Materials Consumed (specify details as per Para 2A) Utilities (specify details as per Para 2B) Direct Employees Cost Direct Expenses Consumable Stores and Spares Repairs and Maintenance Quality						
13	**Total (1 to 12)**						
15	**Cost of Services provided (13 - 14)**						
17 18	**Total Services available (15 + 16)** Less: Self/Captive						
20 21	**Cost of Services Sold (17 - 18 + 19)** Administrative Overheads						
23	**Cost of Sales before Interest (20+21+22)**						
25	**Cost of Sales (23 + 24)**						

27	**Margin [Profit/(Loss) as per Cost**				

2A. Details of Materials Consumed

Name of Service									
Service Code (if applicable)									
Sl. No.	Description of	Category	UOM	Current Year			Previous Year		
				Quan-	Rate per	Amount	Quantity	Rate per	Amount
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10									

Category: Indigenous/ Imported/ Self Manufactured

2B. Details of Utilities Consumed

Name of Service								
Service Code (if applicable)								
Sl. No	Description of Mate- rial	UOM	Current Year			Previous Year		
			Quantity	Rate per	Amount	Quantity	Rate per	Amount
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

2C. Details of Industry Specific Operating Expenses

Name of Service			
Service Code (if applicable)			
Sl.	Description of Industry Specific Operating	Current Amount	Previous Amount
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

8.6 PART-D

1. **PRODUCT AND SERVICE PROFITABILITY STATEMENT (for audited products/services)**

Sl. no.	Particulars	Current Year			Previous Year		
		Sales	Cost of Sales	Margin	Sales	Cost of Sales	Margin
	Product 1						
	Product 2						
	Product 3						
	..... etc.						
	Service 1						
	Service 2						
	Service 3						
	..... etc.						
	Total						

2. **PROFIT RECONCILIATION (for the company as a whole)**

Sl. no.	Particulars	Current	Previous
1	Profit or Loss as per Cost Accounting Records		
	(a) For the audited product(s)/service(s)		
	(b) For the un-audited product(s)/servlce(s)		
2	**Add: Incomes not considered in cost accounts (specify**		
	a)		
	b)		
	c)		
	d)		
	e)		
	f)		
	g)		
	h)		
	i)		
	j)		
	Total		
3	***Less:*** **Expenses not considered in cost accounts (specify**		
	a)		
	b)		
	c)		
	d)		
	e)		
	f)		
	g)		
	h)		
	i)		
	j)		
4	Difference In Valuation of stock between financial accounts		
5	**Adjustments for others (Specify)**		
6	Profit or Loss as per Financial Accounts		

3.	**VALUE ADDITION AND DISTRIBUTION OF EARNINGS (for the**		
Sl. No	**Particul ars**	**Curre nt**	**Previous**
	Value Addition:		
1	Gross Sales (excluding sales returns)		
2	Less: Excise duty, etc.		
3	**Net Sales**		
4	Add: Export Incentives		
5	Add/less: Adjustment In Finished Stocks		
6	Less: Cost of bought out inputs		
	(a) Cost of Materials Consumed		
	(b) Process Materials / Chemicals		
	(c) Consumption of Stores and Spares		
	(d) Utilities (e.g. power and fuel)		
	(e) Others, if any		
	Total Cost of bought out inputs		
7	**Value Added**		
8	Add: Income from any other sources		
9	Add: Extra Ordinary Income		
10	**Earnings available for distribution**		
	Distribution of Earnings to:		
1	Employees as salaries and wages, retirement benefits, etc.		
2	Shareholders as dividend		
3	Company as retained funds		
4	Government as taxes (specify)		
5	Extra Ordinary Expenses		
6	Others, if any (specify)		
7	**Total distribution of earnings**		

4. FINANCIAL POSITION AND RATIO ANALYSIS (for the company as a whole)

Sl.	Particul	Units	Curre	Previo
A.	**Financial Position**			
1	Share Capital			
2	Reserves and Surplus			
3	Long Term Borrowings			
4	(a) Gross Assets			
5	(a) Current Assets (b) Less: Current Liabilities & Provisions			
6	Capital Employed			
7	Net Worth			
B.	**Financial Performance**			
1	Value Added			
2	Net Revenue from Operations of			
C.	**Profitability Ratios**			
1	PBT to Capital Employed	%		
2	(B3/A6) PBT to Net worth (B3/ A7)	% %		
D.	**Other Financial Ratios**			
1	Debt- Equity Ratio	%		
2	Current Assets to Current	%		
E.	**Working Capital ratios**			
1	Raw Materials Stock to	Mont		
2	Consumption Stores and Spares	hs		
3	to Consumption Finished Goods Stock to Cost of Sales	Mont		

5. RELATED PARTY TRANSACTIONS (for the company as a whole)

Sl. no.	Name of the Related	Name of the	Nature of Transaction (Sale,	Quantity in Kgs.	Trans-fer	Amount `	Normal Price	Basis adopted to
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Notes:

1. Details shall be furnished for each Related Party and Product /Service separately.

2. Details of Related Party transactions without Indicating the Normal Price and the basis thereof shall be considered as incomplete Information.

RECONCILIATION OF INDIRECT TAXES (for the Company as a whole)

	Particulars	Assessable Value	Excise	Service Tax	Cess and	VAT/
	Total Clearances					
1	Domestic					
2	Export					
3	Stock Transfers (Net)					
4	Others etc.					
5	**Total Excise Duty (1 to 4)**					
6	Service Tax					
7	VAT, CST etc.					
8	Other State Taxes, if any					
9	**Total Duties/Taxes Payable (5**					
	Duties/Taxes Paid					
10	Cenvat/VAT Credit Utillised-					

11	Cenvat/VAT Credit Utllised – Capital Goods					
12	Cenvat/VAT Credit Utillised – Input					
13	Cenvat/VAT Credit Utilised –					
14	**Total (10 to 13)**					
15	Paid through PLA/Cash					
16	**Total Duties/Taxes paid (14 +**					
17	Duties/Taxes recovered					
18	Difference between Duties/Taxes					
19	Interest/Penalty/Fines Paid (interest paid on price revision)					

Note: Provide separate amounts in notes in respect of item 4 above.

KEYWORDS

1. **Cost auditor-** means a Cost Accountant in practice, as defined in clause **(b)**, who is appointed by the Board;

2. **Cost audit report**- means the duly signed cost auditor's report on the cost records examined and cost statements which are prepared as per these rules, including attachment, annexure, qualifications or observations attached with or included in such report

3. **Cost records -** means books of account relating to utilization of materials, labour and other items of cost as applicable to the production of goods or provision of services as provided in section 148 of the Act and these rules;

4. **Form**- means a form annexed to these rules;

5. **Institute**- means the Institute of Cost Accountants of India constituted under the Cost and Works Accountants Act, 1959 (23 of 1959).

8.7 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1. Profit reconciliation for the Company as a whole is dealt in

a. Para 8 of the annexure to Cost Audit Report under Companies (Cost Audit Report) Rules 2011

b. Para 7 of the annexure to Cost Audit Report under Companies (Cost Audit Report) Rules 2011

c. Para 6 of the annexure to Cost Audit Report under Companies (Cost Audit Report) Rules 2011

d. Para 4 of the annexure to Cost Audit Report under Companies (Cost Audit Report) Rules 2011

2. Form A XBRL is used for filing

a. Cost Audit Report of a Company
b. Annual Report of a Company
c. Compliance Report of a Company
d. Annual Accounts of a Company

3. The main purpose of 'efficiency Audit' is to ensure that

a. Every rupee invested gives optimum returns
b. Planned expenditure gives optimum returns
c. Various policies of management are implemented
d. Activities of business are beneficial to Society at large

4. Para 10 of the annexure to Cost Audit Report under Companies (Cost Audit Report) Rules 2011 deals with

a. Installed Capacity and Actual Production
b. Capital employed
c. Related Party transactions for the Company as a whole
d. Reconciliation of Indirect taxes for the Company as a whole

ANSWERS TO CHECK YOUR PROGRESS-A

1.b 2.c 3.a 4.c

8.8 REFERENCES

1. Kishore, Ravi. “Advanced Cost Accounting and Cost Systems,” Taxmann Publications Private Limited.

2. Pasricha A.S and Vashist A.K. “Cost Accounting ”, Unistar Publications .

3. Horngren ,Charles T. and Datar ,Srikant M., “Cost Accounting: A Managerial Emphasis”

4. Saxena V.K and Vashist C.D “Cost Management,” Sultan Chand and Sons Publications.

8.9 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Mention briefly the general features of Cost Accounting Records.

Q.No.2 Discuss the areas of activity in respect of which coat accounting records are to be maintained.

UNIT -9

COST ACCOUNTING STANDARDS

STRUCTURE

9.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Introduction to Cost Accounting Standards
- Purpose of CAS
- Need for CAS
- Cost Statements

- Objectives of Cost Accounting Standards in India
- Cost Accounting Standard Board (CASB)
- Composition of CASB
- Application of Accounting Standards
- Non-applicability of Accounting Standards
- National Advisory Committee on Accounting and Auditing Standards (NACAAS)
- Compliance of IFRS and AS in CAS
- Valuation of assets
- Harmonization of CAS and AS
- Cost Accounting Standards

9.2 INTRODUCTION

Cost Accounting Standards (CAS) issued by the Council of the Institute of Cost and Accountants of India (ICAI) made it compulsory, with effect from period on or after 1St April 2010 for preparation and documentation of General Purpose Cost Accounting Statements.

ICAI, the peak body on Cost Accounting Profession in India, so far developed 39 Cost Accounting Standards like the ones for Financial Accounting Standards issued by Institutes of Chartered Accountants Association of India (ICAI). It shall be the obligation of the Cost Accountant to make a suitable revelation in his Audit Report/Certificate. These CASs issued by ICAI are in line with the International Financial Reporting Standards (IFRS)

After Liberalization, the service sector has grown progressively and is accounting for 55% of the total GDP of the country. The service sectors like Banking, Insurance, Health service, Education, Hotel etc., have attained deliberate importance for the growth of economy. Maintenance of cost accounting records by the corporate sector is changing from existing rule or format based apparatus to principle based mechanism. Thus, the cost accounting should be done in a systematic manner subjected to systematic accounting procedures that they are to be useful for taking cost policy decisions. It is not only AS which would unite fully with the IFRS but CAS also need to be in harmony with global market.

9.3 ADVANTAGES OF COST ACCOUNTING STANDARDS

Cost Accounting Standards (CAS) are a set of principles that are designed to accomplish uniformity and consistency in cost accounting practices. The principle of the cost statement is to provide an apparent and uniform understanding of all the related issues to various user organizations like corporate, government bodies, regulators, research agencies, academic institutions etc. The following are the advantages of using Cost Accounting Standards (CAS):

- ✓ It will help in providing the real cost data,which will be is very useful in to encourage uniformity & consistency in the preparation and presentation of cost statements
- ✓ It will make the accounts comparable, and help the companies in sustaining efficiency.
- ✓ The companies will become competitive to tackle the larger players having greater resources and better effectiveness.
- ✓ It will result in more precise cost allocations.
- ✓ It will increase the degree of reliance on accounting systems,and their reliability will be appreciated.
- ✓ It will definitely reduce the risk of erroneous charging or mis-allocations.
- ✓ may be made applicable to various government projects where in the public a payment is involved, and it will help the public sector organizations working to serve the society to charge the price based upon the most efficient cost.
- ✓ CAS will be useful to all stakeholders in taking decisions.

9.4 COST STATEMENTS

The manufacturers/sellers are paying attention in maximum profit as they have invested their capital and used their brainpower in the unit. They need data for decision making that gives best possible yield and make certain growth and sustenance. The social organizations and government are more alarmed with how effectively funds are utilized, for social benefits. The tariff authorities are engrossed in fixation of rates for different services. They need cost details for

determining the affordability parameters to readjust revenue collections with capability to pay. Customers or end users are paying attention in getting the product at cheaper rate. Hence, the cost statement should be in tune with the objectives of all stakeholders.

9.5 OBJECTIVES OF COST ACCOUNTING STANDARDS IN INDIA

The Cost Accounting standards (CAS) set by Cost Accounting Standards Board (CASB) of ICAI has the following key objectives:

1. To combine, harmonize and standardize cost accounting principles and practices.
2. To turn up at the basis of computing the cost of product, Activity or service where required by legal or regulatory bodies;
3. To provide direction to the users to achieve uniformity and consistency in classification, dimension, project and allocation of cost to products and services;
4. To support in obvious and regular understanding of all the related issued by various user organization, government bodies, regulators, research agencies, academic institutions etc
5. To facilitate prActicing member to formulate use of cost accounting standards in the matter of verification of general purpose cost statements.

9.6 COST ACCOUNTING STANDARD BOARD (CASB)

The Cost Accounting Standards Board (CASB) set up by the Council of the Institute of Cost and Accountants of India (ICAI) during 1980, later was reconstituted in 1988 as a permanent and autonomous Board to develop Cost Accounting Standards with a limited authority to make, propagate, modify and repeal cost accounting standards and policy. It helps to create standard approach towards maintenance of Cost Accounting Record Rules and Undertaking Cost Audit under Companies Law.

9.7 COMPOSITION OF CASB

The CASB consists of 5 members, Chaired by supervisor of OFPP. Two are from Government which includes one from Defense Department and an additional from General Service Administration. The other two members are from private sectors which include one from

Industry and another one is a Cost Accounting Expert. The Quorum consists of 3 members, of which one must be a member from private.

COST ACCOUNTING STANDARDS SETTING PROCESS

The standard setting procedure of the CASB has been briefly explained below:

- Identification of the extensive areas/topics where cost accounting standards are required by

Organizing and initiating discussion and reflection at national level.

- Generates information on all alternative cost accounting practices in respect of selected practices.
- Prepares the draft on the standard cost accounting practices in respect of selected areas/topic in cost accounting and mingle it to the members of the Institute, national accounting institute and other end user bodies like industry association, Chambers of Commerce and Industry, Government bodies etc.
- After allowing adequate time for consideration and comments, enunciate the exposure draft as „standard".
- After giving due consideration to the suggestions and alteration generated on the dispersed exposure drafts from individuals and agencies will fix a date for the standard to be valuable.
- It will revise the „standards" once issued, if dictated by environment, government, legal authority and other situation.

The „Standards" issued by CASB will be recommendatory. The Standards will make sure that it must comply with the legal regulations in respect of the matter covered by it and will have to be more definite and precise than its legal requirements.

Every standard will mostly have two parts:

(a) Explanatory part

(b) Operative part.

The explanatory section will set out topic covered, the grounds, the necessitate for

standardization and methodology and underlying principle for prActice suggested. The second part, the operative portion will be the definite direction on the matter. The standards will be appropriate to preparation of cost statements and other documents. Every standard will point out the date from which it will be functioning.

9.8 APPLICATION OF ACCOUNTING STANDARDS

So long the standards are not compulsory by National Accounting Standard Board or by Companies Act, the CASB does not acquire the legal authority to make an impression its views as statutory regulations but it is by influence that the standards can be followed as normal prActice by the members of the profession. ICAI will be duty bounce to guard its members who respect and hold on to the standard prescribed. Corrective restriction may be imposed by the Council of the Institute at suitable stages as may be felt essential for not complying with or not exaltation the standard.

9.9 NON-APPLICABILITY OF ACCOUNTING STANDARDS

According to the guidelines issued by Cost Accounting Standards Board of ICAI, the cost accounting standards are not applicable to

1) Commercial Items

2) Cost type of ContrActs

9.10 NATIONAL ADVISORY COMMITTEE ON ACCOUNTING AND AUDITING STANDARDS (NACAAS)

NACAS was constituted in 2001 to recommend the Government in prescribing the policies on accounting and auditing. NACAAS comprise legislative body from regulatory bodies such as ICAI, SEBI, the RBI, ICAI, and ICSI, IA&AS, the Corporate Affairs Ministry, the CBDT, industry chambers and the Comptroller and Auditor-General. It examines only ICAI‟s accounting standards for companies in the country, but not for auditing standards. Auditing standards were the sole domain of ICAI.

9.11 COMPLIANCE OF IFRS AND AS IN CAS

International Financial Reporting Standards (IFRS) issued by International Accounting Standards Board (IASB), as a standardized language of business to protect the interest of

International Investors are followed by more than a 100 countries of the world. The ICAI of India is bringing out the cost accounting standards in line with IFRS. CASB incorporates the principles enshrined by current International Good PrActice Guidance and Management Accounting Guidelines issued by International Federation of Accountants (IFAC) in their CAS. Thus all the Cost Accounting Standards will have to be reviewed and associated with the appropriate issues in IFRS devoid of sacrificing the basic objectives whenever necessary.

9.12 VALUATION OF ASSETS

IFRS is now moving away from historical cost in valuation of asset which will have an impAct not only on raw material cost but also on finished goods and overheads. Thus, IFRS has been revised and discarded the historical cost and replaced it by current cost system.

9.13 HARMONIZATION OF CAS & AS

There should be whole harmonization between the Cost Accounting Standards (CAS) and financial Accounting Standards (AS). Thus, the ICAI in discussion with ICAI prepares a list of such items which need harmonization in two sets of standards i.e., AS and CAS and bring up to date the list periodically. If on specific cost related item which require different treatment based on cost accounting principles, the deviation should be disclosed as reconciliation between the costing profit & loss statement and financial profit & loss statement.

9.14 CURRENT STATUS OF COST ACCOUNTING STANDARDS

The Council of the ICAI in their meeting during Feb. 2009 resolved that the application of the following Cost Accounting Standards are obligatory with effect from period commencing on or after 1st April 2010 for preparation and certification of General Purpose Cost Accounting Statements. The Cost accountants have to apply these cost accounting standards for preparation and presentation of cost statements on or after 1st April 2010. The prActicing cost accountants‟ duty to comply the above provisions, if not complied makes a explanation for non-compliance in his audit report/certificate.

CAS 1: Classification of Cost:

The standard deals with the principle of classifying costs in the cost statements. The objective is to prescribe the classification of costs for ascertainment of cost of a product or service and

preparation of cost statements on a consistent and uniform basis with a view to effect the comparability of the same of an enterprise with that of previous periods and of other enterprises.

Basis of Classification:

i) Nature of expense

ii) Relation to object – traceability

iii) Functions / Activities

iv) Behavior fixed, semi-variable or variable

v) Management decision making

vi) Production Process

vii) Time period

Presentation and Disclosure

The classification of cost item should be followed consistently from period to period. A preparation of cost statements should be made with reference to a period of time. A change in classification should be made only if it required by law or for compliance with a Cost Accounting Standard or the change would reset in a more appropriate preparation or presentation of cost statements of an enterprise.

Any change in classification of cost which has a material effect on the cost of the product should be disclosed in the cost statements. Where the effect of such change is not ascertainable wholly or partly, the fact should be indicated in the cost statement.

CAS 2 : CAPACITY DETERMINATION.

The objective of the standard is to prescribe the method of determination of capacity to be applied uniformly and consistently and to help in proper allocation, apportionment and absorption of cost. The standard is applicable for an undertaking, whether existing or new, where there is expansion of more than 5% of the existing capacity due to introduction of new machines or productive resources. Similarly, the standard is also applicable where there is more than 5% reduction of the existing capacity due to disposal or withdrawal or impairment of old machines

or productive resources.

Disclosure:

The details of basis for arriving at the capacity, variables used and assumptions made should be disclosed. Any change in the installed capacity due to modifications in the machines/ equipment or addition of balancing equipment or disposal or impairment of some machines/ equipment should be disclosed. Further, the licensed capacity and installed capacity should be disclosed in absolute term of production whereas prActical capacity, normal capacity and Actual capacity utilization should be disclosed in absolute term as well as in percentage of installed capacity.

CAS 3: PRODUCTION AND OPERATIONS OVERHEADS

The Objective standard is to prescribe the methods of collection, allocation, apportionment of overheads to different cost centers and absorption thereof to products or services on a consistent and uniform basis in the preparation of cost statements and to facilitate inter-firm and intra-firm comparison. Further, the standardization of collection, allocation, apportionment and absorption of overheads is to provide a scientific basis for determination of cost of different Activities, products, services, assets, etc. The standard should be followed for treatment of overheads by all enterprise.

Overheads are to be apportioned to different cost centers based on following two principles: Cause and Effect – Cause is the process or operation or Activity and **effect** is the incurrence of cost, Benefits received – overheads are to be apportioned to the various cost centers in proportion to the benefits received by them.

Presentation and Disclosure:

Once the basis of collection, allocation, apportionment and absorption for different production cost centers are selected. The same shall be followed consistently and uniformly. Change in basis for collection, allocation, apportionment and absorption can be adopted only when it is compelled by the change in circumstances like change in technology, refinement and improvement in the basis etc and the change would provide more scientific approach. In case of such changes, proper disclosure in cost records is essential.. If such change has a material effect on the cost of the product should be disclosed in the cost statements. Where the effect of such change is not ascertainable wholly or partly, the fact should be indicated in the cost statement.

CAS 4 : COST OF PRODUCTION FOR CAPTIVE CONSUMPTION

The Objective of this standard is to bring uniformity in the principles and methods used for determining the cost of production of excisable goods used for captive consumption. The standard and its disclosure will provide better transparency in the valuation of excisable goods used for captive consumption.

Disclosure

If there is any change in cost accounting principles and practices during the concerned period which may materially affect the cost of production in terms of comparability with previous periods, the same should be disclosed and if opening stock and closing stock of work -in-progress and finished goods are not readily available for certification purpose, the same should be disclosed.

CAS 5: AVERAGE (EQUALIZED) COST OF TRANSPORTATION:

The objective of this standard is to bring uniformity in the application of principles and methods used in the determination of averaged/equalized transportation cost. And to provide transparency in the determination of cost of transportation The standard applied for calculation of cost of transportation required under any statute or regulations or for any other purpose. An enterprise shall be required to maintain cost records and other books of account in a manner which would facilitate preparation and verification of cost of transportation and other related charges and its apportioning to various products. The cost sheets shall be prepared and presented in a form as per Appendices 1, 2 and 3 or as near thereto.

CAS 6: MATERIAL COST:

This standard deals with principles and methods of determining the Material Cost. Material includes raw materials, process materials, additives, manufactured / bought out components, sub-assemblies, accessories, semi finished goods, consumable stores, spares and other indirect materials.

The objective of this standard is to bring uniformity and consistency in the principles and methods of determining the material cost with reasonable accuracy**.** Cost Statements governed by this standard, shall present material costs as detailed below

Direct Materials shall be classified into:

- Raw materials,
- Components,
- Semi finished goods and
- Sub-assemblies

Disclosures

The standard should disclose the quantity and rates of major items of materials which form 5% of cost of materials, the basis of valuation of materials, any change in the cost accounting principles and methods applied for the determination of the material cost during the period covered by the cost statement which has a material effect on the cost of the material shall be disclosed. Where the effect of such change is not ascertainable wholly or partly, the fact shall be indicated. Disclosures shall be made only where significant, material and quantifiable. Disclosures may be made in the body of the Cost statement or as a footnote or as a separate schedule**.**

CAS 7: EMPLOYEE COST

Employee cost is a significant factor of cost of production. But, its significance is decreasing due to automation in production. However in knowledge based industry such as software industry, employee cost is the single most important factor of cost of product / service. The term "employee costs" refers to the expenditure incurred by an entity towards the services performed by the employees of such an entity. In normal parlance employee costs include wages/ salaries, allowances and bonuses, paid by an employer in cash or in kind to employee in return for the work done. However such costs also include employer contribution to social saving schemes, payments for days not worked and remunerations in kind such as provision of free or concessional food, drink, fuel and other amenities. There are a number of other costs which do not appear in the payroll but are employee related cost such as: recruitment costs, training costs, relocation costs, support / social costs, and personnel administration costs. The employee cost is also sometimes termed as “Labour cost”.

CAS 8: COST OF UTILITIES

Production processes need several inputs other than raw material in the form of water, steam, electricity, and the like. These inputs are known as utilities. Utilities are classified according to

the nature of utility, such as power, steam, water, compressed air and so on.

A distinction is to be made whether an input is a utility or production input. For example in case of manufacture of Caustic Soda, electricity is a principal input for electrolysis of brine. If there are multiple connections/source of supply of electricity and in production of Caustic soda one of the source is directly connected, it is to be treated as production input and not as utility. For other connection where utility power is distributed to one or more end users, it is to be treated as utility.

CAS 9: PACKING MATERIAL COST

Packaging is enclosing or protecting products for distribution, storage, sale, and use. Material used for packaging is termed as Packing Material. Packing material is required for containment, protection, handling, presentation, delivery, transporting, warehousing, logistics, sale, and end use. The products enclosed in the package require protection from, among other things, shock, vibration, compression, temperature, and the like. Packaging can play an important role in reducing the security risks of shipment. Packages can be made with improved tamper resistance to deter tampering. Packages can have features that add convenience in distribution, handling, stacking, display, sale, opening, reclosing, use, dispensing and reuse.

CAS 10: DIRECT EXPENSES

Direct Expenses are the expenses relating to manufacture of a product or rendering of a service which can be identified or linked with the cost object other than those incurred on direct material and direct employee cost.

Examples of Direct Expenses are royalties charged on the basis of production, job charges, hire charges for use of specific equipment for a specific product, cost of special designs or drawings for a product, software services specifically required for a job product, travelling expenses for a specific product. These are dealt below:-

(i) Royalty: Royalty is to be paid to Collaborators or technology suppliers in terms of agreement entered with them. It is payable either in relation to production or sales during the accounting period. If royalty payment is to be computed on the basis of production the same should be treated as Direct Expenses. Royalty for Upgrading Technology for the product will be included in cost of production, irrespective of whether it is paid on production basis or sales basis. Royalty for Marketing and Distribution, if paid, will be excluded from cost of production.

(ii) Technical Assistance/Know-how fees:

Technical Assistance/know-how fees are paid for acquiring Technical assistance /Know-how. Custom duty paid/payable at the time of import of technical knowhow is treated as part of cost of technical knowhow.

CAS No.	**Title**	**Objective**
CAS-1	Classification of cost	For preparation of Cost Statements
CAS-2	Capacity Determination	To bring uniformity and consistency in the principles and methods of determination
		of capacity with reasonable accuracy
CAS-3	Production and Operations Overhead	To bring uniformity and consistency in the principles and methods of determining the Production or Operation Overheads with reasonable accuracy
CAS-4	Cost of Production for Captive Consumption	To determine the assessable value of excisable goods used for captive consumption.
CAS-5	Average (equalized) Cost of Transportation	To determine averaged/equalized transportation cost
CAS-6	Material Cost	To bring uniformity and consistency in the principles and methods of determining the material cost with reasonable accuracy in an economically feasible manner

CAS-7	Employees Cost	To bring uniformity and consistency in the principles and methods of determining the Employee cost with reasonable accuracy
CAS-8	Cost of Utilities	To bring uniformity and consistency in the principles and methods of determining the Cost of Utilities with
		reasonable accuracy.
CAS-9	Packing Material Cost	To bring uniformity and consistency in the principles and methods of determining the Packing Material Cost with reasonable accuracy.
CAS-10	Direct Expenses	To bring uniformity and consistency in the principles and methods of determining the Direct Expenses with reasonable accuracy.
CAS-11	Administrative Overheads	To bring uniformity and consistency in the principles and methods of determining the Administrative Overheads with reasonable accuracy.

CAS-12	Repairs and Maintenance Cost	To bring uniformity and consistency in the principles and methods of determining the Repairs and Maintenance Cost with reasonable accuracy.
CAS-13	Cost of Service Cost Centre	To bring uniformity and consistency in the principles and methods of determining the Cost of Service Cost Centre with reasonable accuracy.
CAS-14	Pollution Control Cost	To bring uniformity and consistency in the principles
		and methods of determining the Pollution Control Costs with reasonable accuracy.
CAS-15	Selling and Distribution Overheads	To bring uniformity and consistency in the principles and methods of determining the Selling and Distribution Overheads with reasonable accuracy.
CAS-16	Depreciation and Amortization	To bring uniformity and consistency in the principles and methods of determining the Depreciation and Amortisation with reasonable accuracy.

CAS-17	Interest and Financing charges.	To bring uniformity and consistency in the principles ,methods of determining and assigning the Interest and Financing Charges with reasonable accuracy.
CAS-18	Research and Development Cost	To bring uniformity and consistency in the principles and methods of determining the Research, and Development Costs with reasonable accuracy and presentation of the same.
CAS-19	Joint Costs	To bring uniformity and consistency in the principles
		and methods of determining the Joint Costs.
CAS-20	Royalty and Technical Knowhow Fee	To bring uniformity and consistency in the principles and methods of determining the amount of Royalty and Technical Know-how Fee with reasonable accuracy.
CAS-21	Quality Control	To bring uniformity, consistency in the principles, methods of determining and assigning Quality Control cost with reasonable accuracy.

CAS-22	Manufacturing Cost	To bring uniformity and consistency in the principles and methods of determining the Manufacturing Cost of excisable goods
CAS-23	Overburden Removal Cost	To bring uniformity, consistency in the principles, methods of determining and assigning Overburden Removal Cost with reasonable accuracy.
CAS-24	Treatment of Revenue in Cost Statements	To bring uniformity and consistency in the principles and methods for treatment of revenue in cost statements with reasonable accuracy.

9.15 SUGGESTIONS

1. Cost Accounting principles and Cost audit shall be extended to various government projects wherein public spending is involved. All Government/public agencies operating on corporate or non corporate organizations should determine the user charges for utilities and services based on most efficient cost. They must be transparent and made known to the public at large.
2. The Institute of Cost and Works Accountants of India should take initiative in undertaking training of human resources on Cost Accounting standards.
3. The modifications /review of the existing system to the standard should be more relevant to the needs of different stakeholders including company management, shareholders, regulators and end users.
4. The redrafting the existing Cost Accounting Standards in the Indian context should be in light of international best practices, and to align them with the international cost accounting standards issued by the International Federation of Accountants (IFAC).

9.16 Summary

There is a critical need to join together, harmonize and standardize the cost accounting principles and practices. Cost accounting and cost audit is a new order in presentation of cost statements to the stakeholders. It provides a valuable service to the managements of companies in cost analysis and control and increases the competitiveness of the Industrial units. The statement disclosed should be helpful for improving the efficiency in the use of materials, labor and plant, maximizing production and realizing greater profits. In a competitive environment, the Indian industries should run in efficiently competing with internationally established Multinational Companies. There must be a complete shift for maintenance of cost accounting records by the corporate sector from the existing rule/format based mechanism (backed by Cost Accounting Records Rules notified by the Government for each industry separately) to a principle based mechanism (that should be backed by the cost accounting standards and generally accepted cost accounting principles & practices). Thus, there is call for for an authority which should express in preparation and presentation of cost statements and the disclosures to be made. The cost accountants will prepare and present the statement in accordance with the Act

KEYWORDS

1. **CAS –** Cost Accounting Standards, Related to Maintenance of Cost Audit records in line with cost audit record rules.

2. **Cost records-** means books of account relating to utilization of materials, labour and other items of cost as applicable to the production of goods or provision of services as provided in section 148 of the Act and these rules.

3. **Cost Accountant in practice** - means a cost accountant as defined in clause **(b)** of sub- section (1) of section 2 of the Cost and Works Accountants Act, 1959 (23 of 1959), who holds a valid certificate of practice under sub-section (1) of section 6 of that Act and who is deemed to be in practice under sub-section (2) of section 2 thereof, and includes a firm or limited liability partnership of cost accountants.

9.17 CHECK YOUR PROGRESS-A(Select the Correct Answer)

1. The global key professional accounting body is
    a. The Institute of Chartered Accountants of India
    b. The Financial Accounting Standards Board
    c. The International Accounting Standards Committee
    d. The International Accounting Standard Board

2. CAS 14 deals with
    a. Cost of Utilities
    b. Pollution Control Cost
    c. Employee Cost
    d. Packing Material Cost

3. CAS 9 deals with
    a. Cost of Utilities
    b. Pollution Control Cost

c. Employee Cost
d. Packing Material Cost

4. CAS 7 deals with

a. Cost of Utilities
b. Pollution Control Cost
c. Employee Cost
d. Packing Material Cost

5. CAS 8 deals with

a. Cost of Utilities
b. Pollution Control Cost
c. Employee Cost
d. Packing Material Cost

CHECK YOUR PROGRESS-B(TRUE/FALSE)

1. The Director (Technical), The Institute of Cost Accountants of India will be the Secretary of the Cost Accounting Standard Board (CASB).
2. Outward transportation Cost as per CAS-5 shall form part of Cost of Purchase.

ANSWERS TO CHECK YOUR PROGRESS-A

1.d 2.b 3.d 4.c 5.a

ANSWERS TO CHECK YOUR PROGRESS-B

1. True 2. False

9.18 REFERENCES

1. Kishore, Ravi. “Advanced Cost Accounting and Cost Systems,” Taxmann Publications Private Limited.

2. Pasricha A.S and Vashist A.K. “Cost Accounting ”, Unistar Publications .

3. Horngren ,Charles T. and Datar ,Srikant M., “Cost Accounting: A Managerial Emphasis”

4. Saxena V.K and Vashist C.D “Cost Management,” Sultan Chand and Sons Publications.

9.19 TERMINAL AND MODEL QUESTIONS:

Q.No.1 Why there is a need of training on cost accounting standards?

Q.No.2 When can office supplies be charged as a direct charge?

Q.No.3 What is the objective of Cost Accounting Standard on Cost of production for Captive Consumption (CAS -4)?

Q.No.4 Whether all items of Profit & Loss Account, are to be considered while determining the Cost of Production as per CAS - 4?

Q.No.5 Whether any inputs received free of cost shall be included in the Cost of Production under CAS – 4 or not?

Q.No.6 What are Cost Accounting Standards? How are they different from Accounting Standards issued by ICAI?

Q.No.7 What are the objectives of Cost Accounting Standards Board? What is the enforceability of Cost Accounting Standards?

Q.No.8 Write Short Notes on:

(A) Cost Accounting Standards (CAS).

(B) Advantages of Cost Accounting Standards.

(C) Difference between Cost Accounting Standards and Cost Accounting Records Rules.

(D) Disclosure Statement.

UNIT-10

COST AUDIT

STRUCTURE

10.1 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:

- Learning Objectives
- Introduction to Cost Audit
- Scope of Cost Audit
- Objectives of cost audit
- Types of Cost Audit
- Advantages of Cost Audit
- Functions of cost auditor
- Programme of cost audit
- Rights and duties of auditor

10.2 INTRODUCTION TO COST AUDIT:

Cost Audit is a significant review undertaken to authenticate the correctness of Cost Accounts and to make sure that cost accounting principles and planning have been proficiently followed**.** Cost audit represents the verification of cost accounts and check on the adherence to cost accounting plan. Cost Audit ascertains the accurateness of cost accounting records to ensure that they are in conformity with Cost Accounting principles, plans, procedures and objective. **C**ost audit aims to identify the unnecessary wastage or losses and make sure that costing system determines the correct and realistic cost of production. It also provides useful information to the management regarding regulating production, reasonable method of operation, dropping cost of operation and reformulating cost accounting plans.

DEFINITIONS:

- **According to the Chartered Institute of Management Accountants, London:**

"Cost Audit may be defined as the verification of the correctness of cost accounts and of the adherence to the cost accounting plan."

- **According to the Institute of Cost Accountants of India,Kolkata:**

"Cost Audit may be defined as an audit of efficiency, of minute details of expenditure while the work is in progress and not a post-mortem examination. Financial audit is a „fait accompli". Cost audit is mainly a preventive measure, a guide for management policy and decision, in addition to being a barometer of performance".

10.3 SCOPE OF COST AUDIT:

It includes the following:

1. The verification of the rightness or correctness of the cost accounts, in so far as the cost ascertainment of processes or production or services or products are concerned.

2. The check on the observance to the detailed systems of cost accounting and its related records and documents, either through the individual initiative of the business concern, or on the issuance of an order for cost audit by the Central Government under the provisions contained in the Indian Company Law.

3. The concept of cost audit also includes propriety audit as it seeks to highlight the cases where the company‟s funds have been used in a negligent or inefficient manner and the factors which could have been controlled but have not been done resulting in increase in the cost of production. It is an audit concerned with such action and plans of management which have a bearing on the finance and expenditure of the company. The cost auditor has not only to see that an item of expenditure is properly sanctioned and supported by vouchers but also is justifiable on grounds of propriety.

4. Cost audit when introduced under the power of a statute or law is called Statutory Cost Audit. Statutory Cost Audit is a system of audit introduced by the Government of India for the review, examination and appraisal of the cost accounting records and added information required to be maintained by specified industries.
5. Cost Audit also includes efficiency audit as it ensures that every rupee invested in the concern gives the most favorable return, and further ensures the balancing of the investment between different functions of the concern so as to give optimum results. Efficiency audit is an audit concerned with appraisal of performance to determine not only that the expenditure has been incurred according to plan but also to see that the results have been obtained as planned. It starts with examination of plan (such as financial or other functional budgets) and extends to the comparison of actual performance with the budgeted performance and finding out reasons for variances.

10.4 Objectives of Cost Audit

The following are the major objectives of Cost Audit:

1. Protection of the Business:

Cost audit aims at examining that there is no undue wastage or losses and the costing system

brings out the correct and realistic cost of production and processing. The benefit of this protective function is derived by the organization, its owners and consumers.

It deals with proper ascertainment and control of cost by:

a. Detecting errors or ensuring that cost records are compiled correctly;

b. Checking accuracy of records in order to verify that cost accounts are correctly maintained in conformity with accepted cost accounting principles adopted in the industry;

c. Ascertaining whether procedures and routines as laid down by the management are properly and uniformly followed.

2. Constructive Appraisal:

The cost or audit provides the management useful information in regulating production, choosing economical methods of operation, reducing the operational cost and reformulating plans on the basis of his findings during the course of Cost Audit. As far as this audit is concerned, a great deal depends upon the attitude of the management and/or the appointing authority and scope of audit. The auditor acts in this case of audit in an advisory capacity for the well being of the shareholders of the company.

This function may extend to judging:

a. Whether existing procedure, submission of reports and returns are adequate or wasteful. Changes may be introduced in conformity with modern costing techniques and unnecessary routines may be eliminated.

b. Whether the existing procedure is effective to the management for taking decisions.

c. Whether or not the projected expenditure could give the optimum results.

d. Whether the return from capital employed is adequate, if not, whether it can be bettered.

3. Pre-audit or Prior Concurrence:

Here the auditor sees whether the expenditure has already been provided for in the budget estimates and that the cumulative expenditure up-to-date has not exceeded that provision

and the canons of financial propriety. This function is vested in the financial adviser for a control over the utilisation of available finance in case of government organisations.

4. Comparison of Costs:

Comparison of the actual cost for the year is made with the cost pertaining to previous year or years to ascertain whether cost has increased or decreased as compared to the cost of the previous year or years. Comparison of the actual cost with the standard cost is made to know reasons for variances.

By making comparison of costs, the cost auditor is able to know abnormal costs. These abnormal costs are brought to the notice of the management for taking remedial measures so that these costs may not arise in future.

In a nutshell the main objectives of c audit is to to achieve the accuracy of costing data and this is achieved by verifying the arithmetical accuracy of cost accounting by making entries in the books of accounts ,to make sure that cost accounting principles are governed by the management objectives and these are severely followed in preparing cost accounts,to make ensure that cost accounts are correct, notice errors, frauds and wrong practice in the presented system, to test out up the common working of the costing department of the organization and to give suggestions for improvement and to assist the management in taking correct decisions on certain significant matters i.e. to verify the actual cost of production when the goods are ready and to diminish the total of detailed checking by the external auditor if efficient internal cost audit system is in process.

10.5 Types of Cost Audit

1. Cost Audit on behalf of the management:
2. Cost audit on behalf of a customer
3. Cost Audit on behalf of Government
4. Cost Audit by trade association
5. Statutory Cost Audit

1. Cost Audit as an Aid to Management:

The aim is to see that all information placed before management is important, trustworthy and timely so that management can expulsion its duties well. It must also be seen that no relevant or relevant information is concealed.

2. Cost Audit on Behalf of a Customer:

Often contracts are positioned on “Cost Plus” basis. In other words, the customer will determine the final price to be paid on the basis of exact cost plus an agreed margin of profit. The customer, in such a case, generally gets cost accounts of the product concerned audited to establish correct cost and, therefore, price.

3. Cost Audit on Behalf of Government

Sometimes the Government is approached with demand for financial help or protection. Before taking a decision on the request, the Government may choose to get cost accounts of the applicant audited to establish whether the need for help is authentic or is a result of simple inefficiency.

4. Cost Audit on Behalf of the Trade Association:

Sometimes trade associations look for information to maintain prices at a certain level. For this purpose, the correctness of costing information submitted by various concerns has to be checked. The trade associations may search for to have full information about production capacity and the relative efficiency of productive processes.

As per Section 148 of Companies Act, 2013, whereby the Central Government may order that certain classes of companies will get their cost accounts audited by a member of the Institute of Cost Accountants of India. Only such companies as are required to maintain proper records regarding materials consumed, labour and other expenses under Section 128of Companies Act, 2013 and may be required to get their cost accounts audited.

5. Cost Audit under Statute

The Amendment Act of 1965 has inserted a new section, 233B, in the Companies Act, 1956 whereby the Central Government may order that certain classes of companies will get their cost accounts audited by a member of the Institute of Cost Accountants of India. Only such companies as are required to maintain proper records regarding materials consumed, labour and other expenses under Section 209 (as amended to date) and may be required to get their cost accounts audited.

The powers and duties and manner of appointment of the cost auditor are the same as that of external financial auditor and the same disqualifications will apply. The cost auditor will submit his report to the Company Law Board with a copy to the company. The right to investigate all aspects of cost accounts is most probably granted to the cost auditor.

The aim of cost audit under statute seems to be that the Government wishes to know, as an instrument of control, the costs of various goods. Government has the power to set down the forms in which cost audit reports are to be made out. These are designed not only to verify information, but also to express good deal of information to Government.

10.6 Advantages of Cost Audit to Different Sectors:

10.6.1 Advantages to Management:

(i) Errors in following costing principles and techniques are detected. Inconsistencies and frauds can also be detected. This keeps everyone alert and promotes efficiency.

(ii) Cost audit can give out to measure performance of managers and better performance can be rewarded.

(iii) It helps to prepare precise cost reports and this business planning can be more accurate.

(iv) Inter-firm comparisons can be made with easiness.

(v) Cost audit can give an idea about the relative operational efficiency of each department of division; and may thus pin-point deficiencies and also persuade operating in a cutthroat spirit.

10.6.2 Advantages to Cost Accountant:

Important advantages are:

(i) Errors, deficiencies, etc., are barbed out by this his task is facilitated since Costing plans can be organized to take care of these things.

(ii) Cost audit may assist in easier reconciliation of cost and financial accounts.

(iii) If the cost auditor is an outsider and is specialist, he can surely give some practical and crash advice to make more resourceful costing systems and organisation.

(iv) Cost audit helps to spotlight attention of management on the troubles faced by the cost accountant. This helps him to understand his goals and objectives with simplicity.

10.6.3 Advantages to Statutory Auditor:

Important advantages are:

(i) Audited cost data helps him to determine the value of stocks, remuneration of managerial personnel, etc., with easiness and exactness.

(ii) Data and statements of cost audit help him to prepare his audit programme and plan so that he concentrates more on those aspects which have not been effectively covered by cost audit.

10.6.4 Advantages to Consumers:

(i) The direct benefit will come where a statutory cost audit has been ready to fix a reasonable price for the consumers.

(ii) The main aim of cost audit is to ensure efficiency in the organisation; this may also get reflected in condensed prices to the consumers.

10.6.5 Advantages to Labour:

(i) If cost audit is done systematically, labour will also gain through enlarged profitability in the shape of bonus and extra benefits.

(ii) It also brings into center of attention the role of labour in humanizing effectiveness in term of enlarged productivity.

10.6.6 Advantages to Shareholders:

(i) There is correct valuation of all kinds of inventories. This may project a true picture of the organisation before shareholders and other investors and help them to assess its performance.

(ii) External cost audit mainly tells the efficiency or inefficiency, utilization of manpower and other resources, adequacy of return, etc.

10.6.7 Advantages to Government and Economy:

(i) It helps the government to reconcile accounts where cost-plus contracts have been made.

(ii) The government can interfere to protect the interests of the consumers, labour, shareholders and investors from exploit-age or incompetent managements.

(iii) At the national level, cost audit promotes cost awareness and in general efficiency. This means that every rupee invested produces the highest quantity of goods and services.

10.7 Functions of Cost Auditor

The Institute of Cost Accountants of India has detailed the principal functions of a cost

auditor by way of comparison with the functions of the auditor of financial accounts. The principal functions of cost auditor, according to the aforesaid Institute are the following:

(i) Inventory

(a) Is the size of the inventory adequate or excess compared with the production programme?

(b) Is the provision most economical?

(c) Does it ensure optimum order size?

(d) Does it take into account the storage cost on the one hand, and carrying cost on the other?

(e) Does it take note of lead time of the various items or groups of items?

(f) Does the receipt and issue system cause any bottle-neck in production?

(g) Does it involve too many forms and too much paper work?

(h) Is there any room for reduction of inventory cost consistent with production needs?

(i) Is the inventory as per the priced store ledger and as certified by the management physically correct?

(j) Is the same amount of attention and care given to monies translated into material things like raw materials, stores and supplies of all kinds as given to liquid cash?

(k) Does the issue of raw materials make the production in accordance with the standard or schedule or otherwise or covered by authorized schedule?

(i) Is the expenditure of consumable stores within the standard? If not, why not ?

(ii) **Opening and Closing Stocks -** The cost auditor will see the following:

(a) that the opening stock is not unduly large compared with the volume of production during the year;

(b) that the opening stock against various jobs really represents the actual physical stock in the production shop and is not merely an accounting figure;

(c) that the responsibility of the shop foreman in-charge of the stock held in the

production shop is clear and properly documented; that he maintains proper record of actual consumption vis-a-vis the actual withdrawal from the stock.

Valuation and correct indication of closing stock in the Trading and Profit and Loss Account and in Balance Sheet is equally important. The Cost Auditor will examine and certify:

(a) that the physical verification is correctly carried out;

(b) that the valuation is correct with reference to the actual cost of production and recognised policy for valuation;

(c) that volume of closing stock is commensurate with the volume of production and that it does not reflect any failure or bottleneck in sales budget or production budget;

(d) that the volume of unmoved stores is not abnormal in comparison with the normal rate of yearly consumption. The Cost Auditor will recommend disposal of such unmoved stores with consequent release of capital unnecessarily locked up to the advantage of the financial resources of the concern.

(iii) **Store Issue Procedure in Stocks-** The Cost Auditor will see:

(a) that withdrawal of materials or stores to production shop is scientific or covered by authorised schedule and permits receipt to be located;

(b) that there is no possibility of loss or pilferage of stock lying in the production section;

(c) that surplus materials and scraps arising in production shops are returned to stores correctly and without delay for which necessary credit is given to unit cost of production. If transferred to other jobs, proper transfer voucher has been prepared and copies sent to the accounts, stores, etc.

(iv) **Work-in Progress -** The Cost Auditor will see the following:

(a) that work-in-progress has been physically verified and that it agrees with the balance in the incomplete cost card;

(b) that valuation of the work-in-progress is correct with reference to stage of

completion of each job or process and the value job cost cards or process cost sheet; that there is no over-valuation or under-valuation of opening work-in-progress or closing work-in-progress, thereby artificially pushing up and down net profits or net assets as the case may be;

(c) that the volume and value of work-in-progress is not disproportionate compared with the finished out-turn.

(v) Labour -

(a) Proper utilisation of labour and increase in productivity are now receiving attention, several productivity teams have emphasised importance of higher productivity. It is, therefore, essential to assess the performance efficiency of labour and compare it with standard performance, so that labour utilisation could be progressively improved. The labour force in Indian industries is generally very high compared to similar types of industries in other developed countries. Our aim should be to reach that level, though not immediately but over some time. A study of this nature would give an idea where the inefficiency lies so that timely and adequate steps could be taken to ensure maximum utilisation of labour to reduce labour cost.

(b) Cost of labour is allocated to different jobs with reference to time or job cards.

(vi) **Capacity Utilisation -**The cost auditor will see:

(a) that the idle capacity in any production shop or of transport facilities for distribution is not excessive;

(b) that production volume and overall machine time utilised are commensurate. In other words, the machine hours utilised have given the optimum output.

(vii) **Overheads and indirect expenditure -** The cost auditor will see and certify:

(a) that allocation of indirect expenditure over production, sales, and distribution is logical and correct;

(b) that compared with the value of production in a production shop, overhead

charges are not excessive;

(c) that actual indirect expenditure does not exceed budgets or standard expenditure significantly and that any variations are satisfactorily explained and accounted for;

(d) that the relation of indirect expenditure in keeping with the load on individual production shop is appropriate;

(e) correctness of appropriate allocation of overhead expenditure (both production and sales) will be certified by the cost auditor;

(f) that allocation of overheads between finished products and unfinished products is in accordance with correct principles.

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10.8 Programme of Cost Audit

The audit programme should include all the usual broad steps that a financial auditor includes in his audit programme. However, the significant things that should not be missed are: proper vouching of expenses, capital and revenue character determination, allocation of expenses, apportionment of overheads, arithmetical accuracy, the statutory requirements, examination of contracts and agreements, review of the Board"s and shareholders" minute books to trace important decisions having bearing on costs, verification of title deeds and documents relating to properties and assets, etc. Cost audit, in order to be effective, should be completed at one time as far as practicable. The exact content of cost audit largely depends on the size of the organisation, range of products, production process, the existence of a well organised costing department and of a well-designed costing system, and the existence of a capable internal auditing system. Other relevant considerations may be :

(a) System of cost accounting in vogue and the organisation of the cost department, forms, schedules, etc.

(b) System of internal check used in the organisation.

(c) Frequency of audits, areas to be covered, volume of transactions, efficiency of the internal check, needs of management, purpose of cost audit, its benefits, etc.

After considering the aforesaid factors a set of procedures and instructions are

evolved which may be termed the cost audit programme. Like every other audit, a systematic planning of cost audit routine is necessary. Broadly speaking cost audit programme may be divided into the following stages:

(a) Review of Cost Accounting Records - This will include:

(i) Method of costing in use - batch, process or unit.

(ii) Method of accounting for raw materials; stores and spares, wastages, spoilage defectives, etc.

(iii) System of recording wages, salaries, overtime and spares, wastages, etc.

(iv) Basis of allocation of overheads to cost centres and of absorption by products and apportionment of service department‟s expenses.

(v) Treatment of interest, recording of royalties, research and development expenses, etc.

(vi) Method of accounting of depreciation.

(vii) Method of stock-taking and its valuation including inventory policies.

(viii) System of budgetary control.

(ix) System of internal auditing.

(b) Verification of cost statements and other data - This will include the verification of:

(i) Licensed, installed and utilised capacities.

(ii) Financial ratios.

(iii) Production data.

(iv) Cost of raw material consumed, wages and salaries, stores, power and fuel, overheads provision for depreciation etc.

(v) Sales realisation.

(vi) Abnormal non-recurring and special costs.

(vii) Cost statements.

10.9 Rights of a Cost Auditor:

A cost auditor has the same rights in relation to an audit conducted by him under Section 233-B as an auditor of a company under Section 227(1).

Following are his rights:

(i) He has a right of access at all times to the books of accounts and vouchers of the company.

(ii) He has a right to get such information and explanations from the officers of the company as he may think necessary for the performance of his duties as an auditor.

(iii) He has a right to get all facilities and assistance from the company to perform his duties as an auditor.

(iv) The company and every officer, in default of not providing the accounts, vouchers, information, explanations etc. to the auditor, shall be punishable with fine.

The company is obliged to make available to the cost auditor within 90 days of the close of the financial year all such cost accounting books, records, statements and papers as are required by the cost auditor for performing his work. The cost auditor has the right to get the remuneration for his work and this remuneration is decided by the Board of Directors with the approval of the Central Government.

10.10 Duties and Responsibilities of a Cost Auditor:

The duties and responsibilities of a Cost Auditor have not been clearly given in the Companies Act. The cost auditor is also required to perform the duties as are expected from auditors in general.

The main duties and responsibilities of a cost auditor are:

(i) He is liable to the Company if he does not perform his duties properly or is guilty of negligence.

(ii) He also owes a legal responsibility to third parties who might have been misled by his audit certificate and acted in reliance thereon.

(iii) He should maintain his working papers as an evidence of his having carried out his duties.

(iv) He should not disclose any confidential information which he might have acquired in the course of his work and should not use such information for personal gain or gain of a third party.

(v) He is responsible to answer any query required by the Central Government on a scrutiny

of the cost audit report submitted by him.

(vi) He is criminally liable for falsification of books. If he is found guilty of falsification, he shall be punishable with imprisonment for a term which extends to seven years and he shall also be liable to fine in addition.

10.11 Who can be appointing as cost auditor:

A cost Accountant in practice or a firm of cost accountants can be appointed as a cost auditor. A cost accountant holding certificate of practiced on part time basis is not entitled to conduct cost audit. Thus, only a cost accountant in whole-time practice can conduct cost audit.

Who can't be appointed as cost auditor:

Statutory Auditor appointed under Section 139 of the Act can‟t be appointed as Cost Auditor of the Company.

Process for appointment of Cost Auditor:

Consent of Auditor: Before appointment is made, the written consent of the cost auditor to such appointment, and a certificate from him or it, as provided in sub-rule (1A), shall be obtained

If Company has Audit Committee: Appointment and remuneration will be recommended by audit committee and approved by Board.

If Company doesn‟t have Audit Committee: If there is not audit committee, appointment and remuneration fixation will be done by Board. Later, this remuneration shall be ratified by Shareholders.

10.12 Content of the Certificate of cost Auditor:

the individual or the firm, as the case may be, is eligible for appointment and is not disqualified for appointment under the Act, the Cost and Works Accountants Act, 1959 (23 of 1959) and the rules or regulations made there under the individual or the firm, as the case may be, satisfies the criteria provided in section 141 of the Act, so far as may be applicable the proposed appointment is within the limits laid down by or under the authority of the Act; and the list of proceedings against the cost auditor or audit firm or any partner of the audit firm pending with respect to professional matters of conduct, as disclosed in the certificate, is true and correct.

10.13 Information for appointment Cost Auditor:

10.13.1 Information to Cost Auditor: Every Company which requires appointment of Cost Auditor shall inform the Cost auditor of his appointment within 30 days of Board Meeting in which resolution for appointment has passed.

10.13.2 Information to ROC: Company will file form CRA-2 with ROC:

Within 30 days of passing of Resolution in Board Meeting, OR

Within 180 days of the commencement of financial year.

Whichever is earlier.

10.14 Removal of Cost Auditor:

The cost auditor appointed may be removed from his office before the expiry of his term, through a board resolution after giving a reasonable opportunity of being heard to the Cost Auditor and recording the reasons for such removal in writing

Appointment of Cost Auditor in case of Casual Vacancy:
Any casual vacancy in the office of a cost auditor whether due to resignation, death or removal, shall be filed by the Board of Directors within 30 days of such Vacancy.

Company will file form CRA-2 with ROC within said 30 days.

KEYWORDS

1. **Edit checks -** Reasonableness, validity, limit, and completeness tests that are programmed routines designed to check input data and processing results for completeness, accuracy and reasonableness.
2. **Audit, Cost –** Verification of Cost Records and Accounts ,and a check on adherence to prescribed cost accounting procedures and their continuing relevance .
3. **Reasonable assurance** - **I**n audit report, an auditor works within economic limits. The audit opinion, to be economically useful, must be formed in a reasonable time and at reasonable cost. The auditor must decide, exercising professional judgment, whether evidence available within limits of time and cost is sufficient to justify an opinion.
4. **Reaudit -**When an auditor is asked to audit and report on financial statements that have been previously audited and reported on.
5. **Representation-** A letter from management to the auditor representing that the

financial statements are fairly presented.

6. **Review evidence** -is information used by the accountant to provide a reasonable basis for the obtaining of limited assurance?
7. **Sampling error** - Unless the auditor examines 100% of the population, there is some chance the sample results will mislead the auditor.

CHECK YOUR PROGRESS (TRUE/FALSE)

1. Financial audit aims at the verification of financial accounts.
2. Control means examination of books of accounts and vouchers so as to establish their accuracy.
3. Cost audit is concerned with verification of cost accounts.
4. Cost audit confuses the financial auditor.
5. Cost audit is a verification of cost records to estimate the internal efficiency of a business.

ANSWERS TO CHECK YOUR PROGRESS-B

1 True 2 False 3 True 4 False 5 True

10.16 REFERENCES

1. Kishore, Ravi. "Advanced Cost Accounting and Cost Systems," Taxmann Publications Private Limited.

2. Pasricha A.S and Vashist A.K. "Cost Accounting ", Unistar Publications .

3. Horngren ,Charles T. and Datar ,Srikant M., "Cost Accounting: A Managerial Emphasis"

4. Saxena V.K and Vashist C.D "Cost Management," Sultan Chand and Sons Publications.

10.17 TERMINAL AND MODEL QUESTIONS:

Q.No.1 What is meant by the term cost audit? What are the objectives sought to be served by cost audit and what are the advantages of cost audit?

Q.No.2 List the purpose and types of cost audit.

Q.No.3 How cost audit is useful to the society?

Q.No.4 Discuss the purpose of cost audit and circumstances under which a cost audit is desirable.

Q.No.5 What are the areas of activity which a cost audit programme is expected to cover?